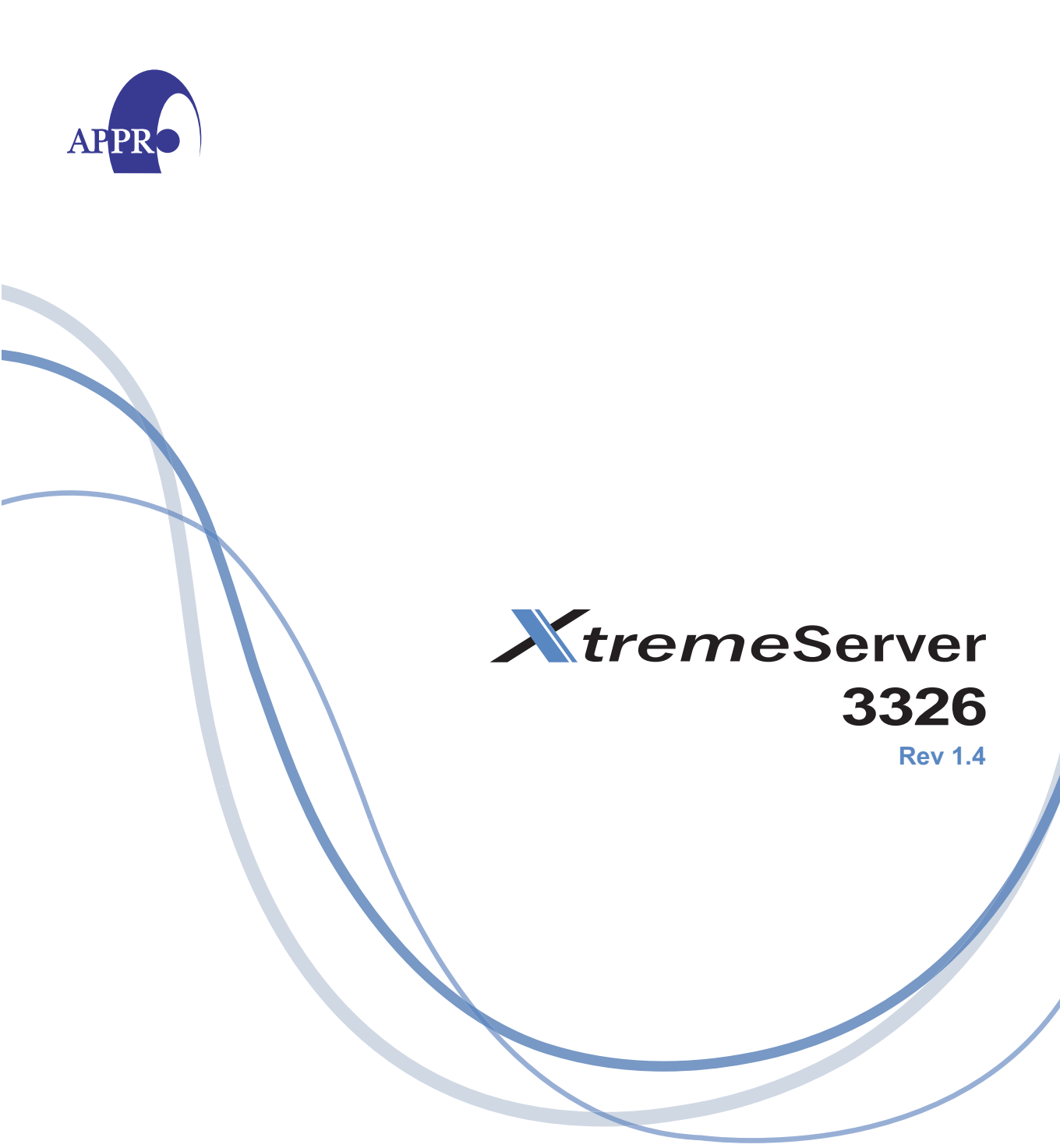

XtremeServer 3326

Rev 1.4

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Part I. User's Guide

Preface

The information in this User's Guide has been carefully reviewed and is believed to be accurate.
The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this Guide, or to notify any person or organization of the updates.

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Technical Support

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Visit the Appro website for FAQ, technical guide, BIOS updates, driver updates, and other information:
http://www.appro.com/ and http://red.appro.com/Public/XtremeServer/
Contact our technical staff at: **http://www.appro.com/supports/main.asp**

Revision History

Revision	Revision History	Date
V1.4	Fourth release	April 2006

1. Introduction

The key objective for XtremeServer is to overcome the major challenges faced by developers, and system integrators alike, in deploying ideal server solutions to the market. Although many, key challenges are identified as reliability, performance, value, scalability and manageability. XtremeServer offers the best in class for each of these challenges by employing the latest technology designed by a specialized sever team.

The XtremeServer 3326 3U Rackmount Server is a high-performance barebone system powered by Dual AMD Opteron™ Processors, nVIDIA nForce Professional 2200 & 2050, AMD 8132 PCI-X Tunnel chipset, ADM1026 Hardware Monitoring Chip.

In addition, 8 DIMM sockets are supported per CPU. This first-in-industry feature increases the performance/value mix by reducing the cost of system memory by up to 100% over competition.

In line with extreme processing and data buffering capability, XtremeServer is equipped with both PCI-Express and PCI-X slots and SATA II with RAID 0, 1 support. For those preferring SCSI devices, dual U320 SCSI channel with RAID option is available. Data transfer is optimized with on-board dual PCI-Express Gigabit Ethernet ports.

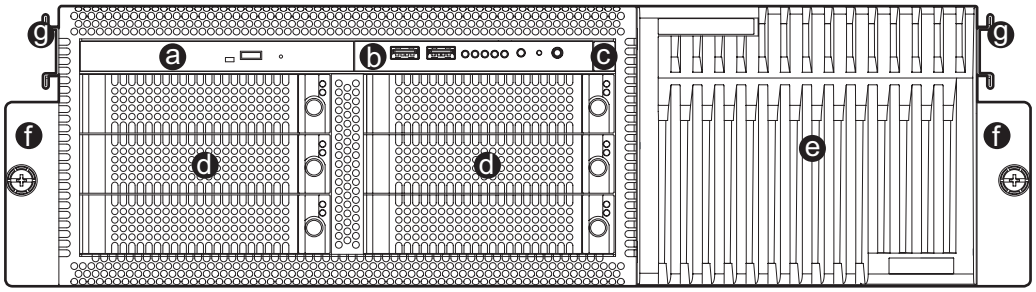
Server management feature is unrivaled by utilizing its dedicated BMC with IPMI 2.0 based ServerDome.

A remote management suite handles all aspects of deployment, management and monitoring of XtremeServer at an individual or aggregate level. Last but not least, XtremeServer is cable-less and tool-less integration.

This well thoughtout packaging keeps all variations of XtremeServer ultra cool and easy to maintain, thus, optimizing on reliability and TCO.

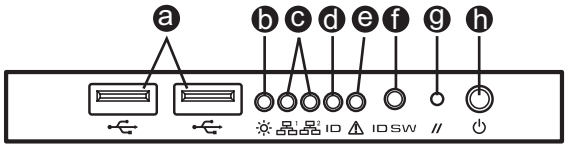
1.1 System Feature

1.1.1 Front View



a. Slim CD-ROM Drive
b. Front Panel Controls and Indicators
c. FDD Ejector button
d. Hard Disk Drive
e. Front Bezel
f. Mounting Bracket
g. Bracket Slide Inner

1.1.2 Front Panel Controls and Indicators

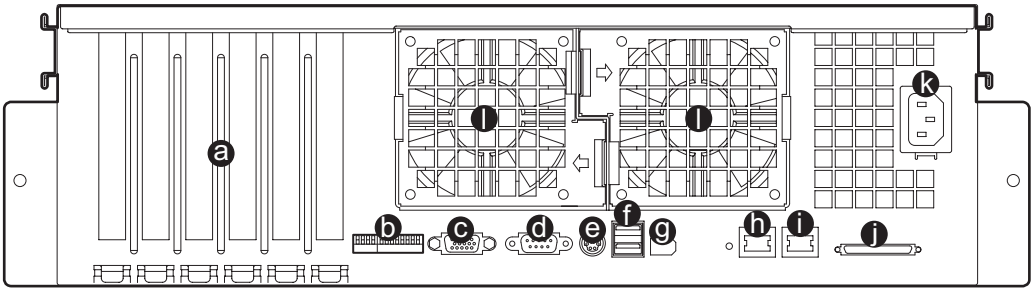


a. USB Ports
b. Power LED
c. LAN Activity LED
d. System ID LED
e. System Fault LED
f. System ID Switch
g. Reset Switch
h. Power ON/OFF Switch

Front Panel LEDs

LED	Color	State	Description
System Power	Blue	On	System is turned on
	Off	Off	System is off
LAN1/LAN2 Activity	Green	Blink	Network is linked and accessed
	Green	Off	No LAN access
System ID	White	On	Identification is active by management software
	Off	Off	Identification is not active
System Fault	Off	Off	Running/normal operation
	Red	On	Critical or non-recoverable condition
HDD Status	Green	On	HDD exists and is powered
	Off	Off	No HDD
HDD Activity	Green	Blink	Disk is accessed
	Off	Off	No disk activity

1.1.3 Rear View

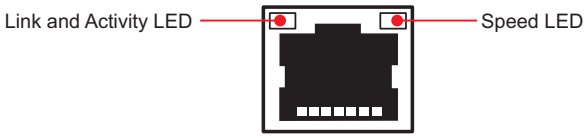


a. PCI Slots
b. System Geographical ID Switch
c. VGA Port
d. Serial Port
e. PS/2 Port(Keyboard & Mouse)
f. USB 2.0 Ports
g. IEEE 1394 Port
h. GbE LAN Port(IPMI)
i. GbE LAN Port
j. External SCSI Port
k. AC Power Inlet
l. Rear Fan

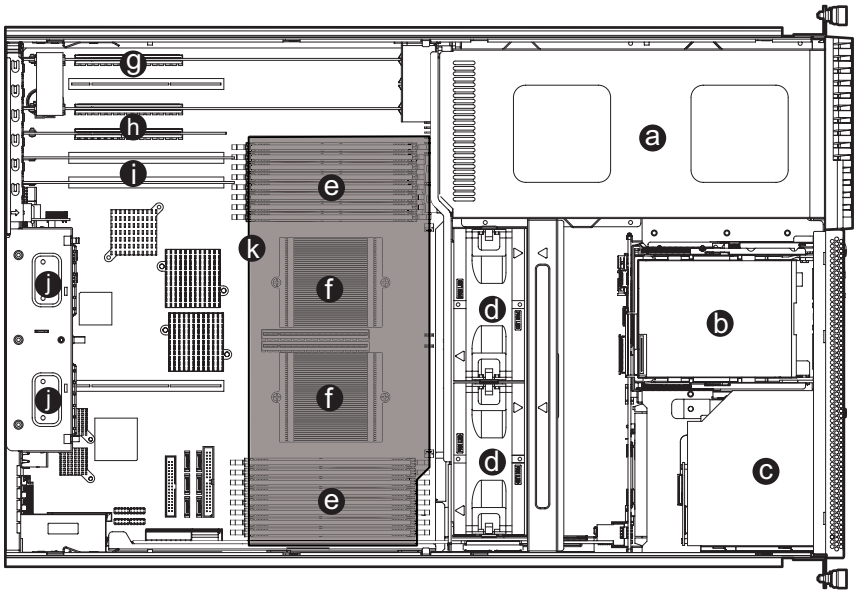
LAN Port Function

The LAN port uses a CAT 6 LAN cable for connecting the motherboard to a local area network by means of a network hub. The port has 2 indicator LEDs.

LED	Color	State	Description
Link and Activity	Green	Blink	LAN is linked and accessed
	Off	Off	LAN is not linked
Speed	Orange	On	Gigabit mode access
	Yellow	On	100Mbps mode access
	Green	Off	10Mbps mode access

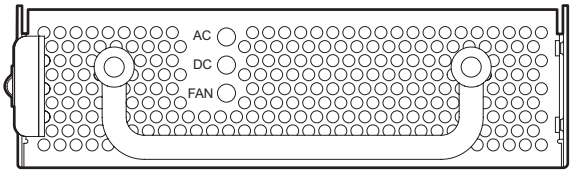


1.1.4 Inner View



a. Power Supply
b. Silm FDD
c. Silm CD-ROM
d. Center Fan
e. Memory DIMM Slots
f. Heatsink
g. PCI-Express Add-on Card(Optional)
h. PCI-Express Add-on Cards
i. PCI-X Add-on Cards
j. Rear Fan
k. CPU / Memory Air Duct

1.1.5 Power LED Indication



AC: Green - Normal
Yellow - Fail
DC: Green - Normal
Yellow - Fail
FAN: Green - Normal
Yellow - Fail

NOTICE

You can check the power status LED after the front bezel is removed.

1.2 System Specifications

Processor

Dual mPGA 940-pin ZIF sockets
Supports up to 2P/4C Dual-Core AMD Opteron™ 800 Series processors
Integrated 128bit DDR memory controller

Chipset

NVIDIA® nForce™ Professional 2200
AMD-8132™ PCI-X 2.0 Tunnel
NVIDIA® nForce™ Professional 2050 (3326VA-01)
Winbond Super I/O chip
Analog Devices® hardware monitoring chip

Memory

128-bit dual channel memory bus
Eight DIMMs per CPU, up to 64GB memory capacity
Registered ECC DDR400/333/266 SDRAM DIMM

SATA Controller (3326VA-01)

Integrated nForce™ Professional 2200 and 2050
Six ports supporting RAID 0, 1, 0+1

SCSI Controller (3326ES-01)

Adaptec® AIC-7902W dual channel U320 SCSI controller
1CH shared with External SCSI port
Adaptec® HostRAID

IDE Controller

Integrated nForce™ Professional 2200
One port for CD-ROM Drive
2.5" HDD (optional)

Drive Bays

Supports six hot-swap SATA HDD (3326VA-01)
Supports six hot-swap U320 SCSI HDD (3326ES-01)
Supports Slim CD-ROM and Slim FDD Drive

Expansion Slots

Two x16 PCI-Express slot supporting full-length add-on card
One x4 PCI-Express slot supporting half-length add-on card
Two 64bit 133/100/66MHz PCI-X slot supporting half-length add-on card
One 64bit 133/100/66MHz PCI-X slot supporting full-length add-on card

Integrated I/O

Rear I/O

- One VGA port
- One serial port
- One PS/2 keyboard & mouse port
- Two USB 2.0 ports
- Two RJ45 GbE ports
- One IEEE-1394a (Firewire) port
- One VHDCI external SCSI connector (3326ES-01)

Front LED Panel

- Two USB 2.0 ports
- LEDs: Power / GbE LAN1 / GbE LAN2 / ID / System Fault
- Switches: System ID / Reset / Power

System Management

FAN connectors

- For CPU / System - Two step speed control

Port 80h 7 segment display

BMC

- Supports IPMI 2.0 specification
- Auto fan speed control
- Voltage and fan speed monitoring

LAN Controller

Two Broadcom® BCM5721 PCI-Express gigabit ethernet controllers

Support PXE function

Video Controller

ATI® RAGE™ XL with 8MB

BIOS

AMI BIOS

Support ACPI 2.0 with S0/S1/S3/S4 and S5

Support AMD PowerNow!

48-bit LBA support

Support USB K/B & Mouse

Serial Console Redirection

Support USB boot and PXE boot in boot sequence

Support serial over LAN function

Power Supply

1000W(2+1) hot-swap redundant Power Supply with PFC function

AC Input: 100-240 VAC at 50/60 MHz; 8-4A

Form Factor

3U (H x W x D): 131 x 430 x 698 mm (5.2 x 16.9 x 27.5 inch)

Regulatory

CE(EMC) : EN55022(EMI), EN55024(EMS), EN61000-3-2(Harmonic), EN61000-3-3(Flicker)

CE(LVD) : EN60950

CB : IEC 60950

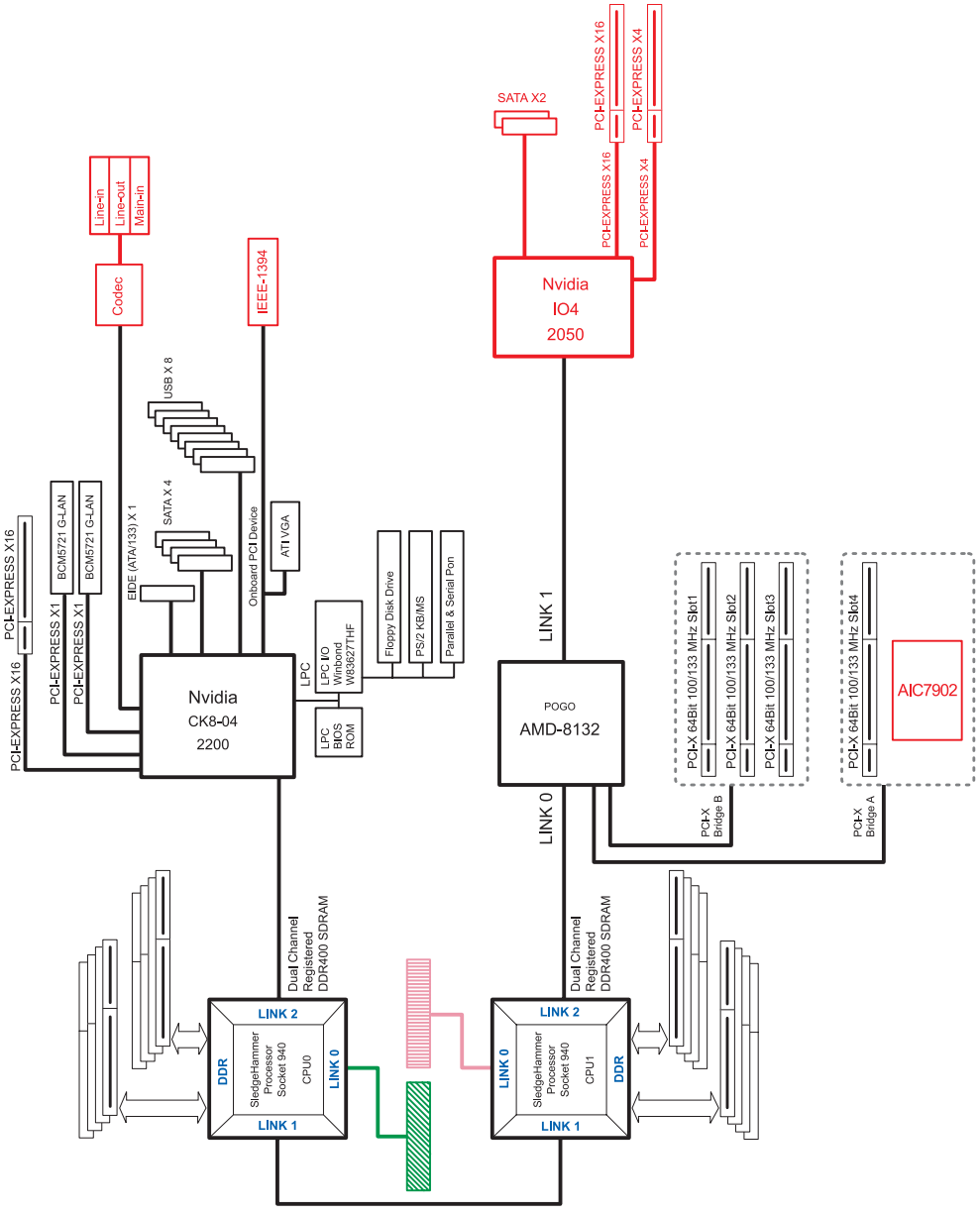
FCC : FCC 15 Subpart A

UL : UL 60950

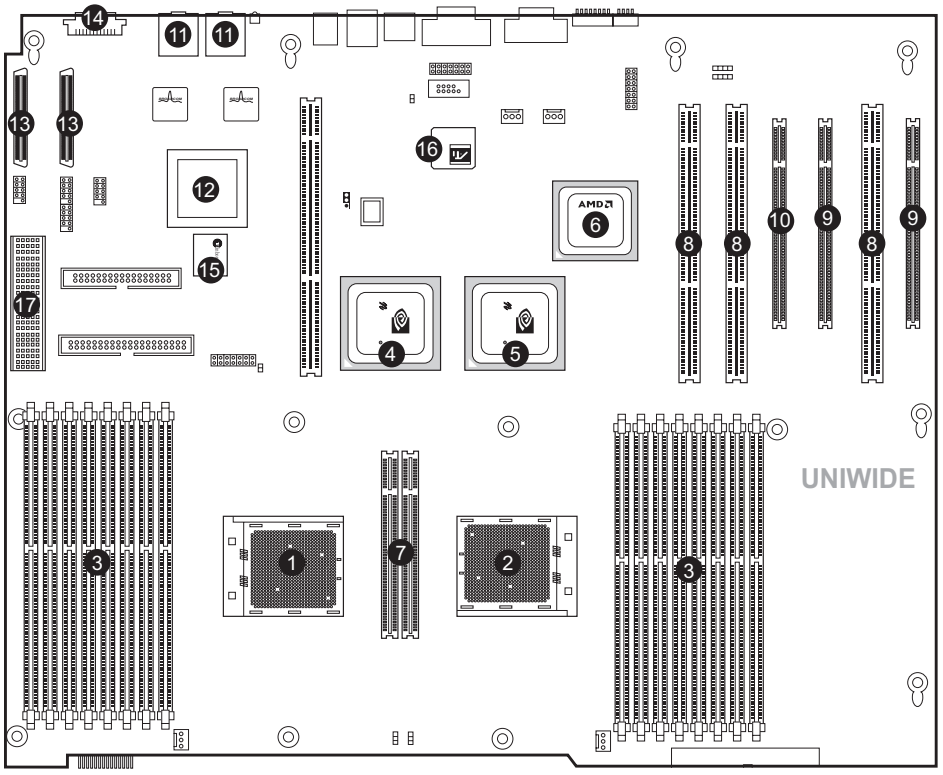
MIC : KN22(EMI), KN24(EMS)

1.3 Mainboard Layout

1.3.1 Block Diagram



1.3.2 Mainboard Layout



① AMD Opteron™ Socket 940 - CPU0
② AMD Opteron™ Socket 940 - CPU1
③ Registered ECC DDR memory slots
④ NVIDIA nForce™ Professional 2200
⑤ NVIDIA nForce™ Professional 2050
⑥ AMD® 8132 PCI-X 2.0 Tunnel
⑦ HT Connector
⑧ PCI-X 64bit/133MHz slots
⑨ PCI Express x16 slot
⑩ PCI Express x4 slot
⑪ Two Broadcom® PCI Express GbE ports
⑫ Adaptec AIC-7902W SCSI Host Adapter
⑬ 68P SCSI Connector
⑭ VHDCI External SCSI Connector
⑮ Winbond 83627THF LPC Super I/O
⑯ ATI Rage XL Video Controller
⑰ Interface Connector

2. Important Safety Information

Only a technically qualified person shall access, integrate, configure, and service this product.

To avoid personal injury or property damage, read, observe, and adhere to all of the following safety instructions and information before you begin installing the product.

2.1 Intended application uses

This product was evaluated as information technology equipment (ITE), which may be installed in offices, schools, computer rooms, and similar commercial type locations. The suitability of this product for other product categories and environment (such as medial, industrial, alarm systems, and test equipment), other than an ITE application, may require further evaluation.

2.2 Checking the power cord

CAUTION

To avoid electrical shock, check the power cord(s) that will be used with the product:

Do not attempt to modify or use the AC power cord(s) if they are not the exact type required.

If a power cord is not compatible with the AC wall outlet in your region, get one that meets the following criteria:

- The power cord must be properly rated for the AC voltage in your region.
- The power cord plug cap must have an electrical current rating that is at least 125% of the electrical current rating of the product.
- The power cord plug cap that plugs into the wall socket-outlet must have a grounding type male plug designed for use in your region.
- The power cord must have safety certifications for your region, and shall be marked with the certification markings.
- The power cord plug cap that plugs into the AC receptacle on the power supply must be an IEC 320, sheet C13, type female connector.
- In Europe, the power cord must be less than 4.5 meters (14.76 feet) long, and it must be flexible <HAR> (harmonized) or VDE certified cordage to comply with the chassis' safety certifications.

The power supply cord(s) is the main disconnect device to AC power.

The socket outlet(s) shall be near the equipment and shall be readily accessible for disconnection.

2.3 Earth-grounded socket outlets

CAUTION

To avoid electrical shock, the system power cord(s) must be plugged into socket-outlet(s) that is provided with a suitable earth ground. The system will be provided with the following marking:

- Connect only to properly earthed socket outlet.

2.4 Before you remove the access covers

CAUTION

To avoid personal injury or property damage, the following safety instructions apply whenever accessing inside the product:

- Turn off all peripheral devices connected to this product.
- Turn off the system by pressing the power button on the front of the product.
- Disconnect the AC power by unplugging all AC power cords from the system or wall outlet.
- Disconnect all cables and telecommunication lines that are connected to the system.
- Retain all screws or other fasteners when removing access cover(s). Upon completion of accessing inside the product, refasten access cover with original screws or fasteners.
- Do not access inside power supply. There are no serviceable parts in the power supply.
- Return to manufacturer for servicing.

2.5 Fans

CAUTION

To avoid injury, do not contact moving fan blades.

2.6 Electrostatic discharge (ESD)

CAUTION

Perform the procedures in this product guide only at an electrostatic discharge (ESD) workstation, because the server components can be extremely sensitive to ESD. If no such station is available, you can reduce the risk of electrostatic discharge ESD damage by doing the following:

- Wear an antistatic wrist strap and attach it to a metal part of the server.
- Touch the metal on the server chassis before touching the server components.
- Keep part of your body in contact with the metal server chassis to dissipate the static charge while handling the components.
- Avoid moving around unnecessarily.
- Hold the server components (especially boards) only by the edges.
- Place the server components on a grounded, static-free surface.
- Use a conductive foam pad if available but not the component wrapper.
- Do not slide the components over any surface.

2.7 Cooling and Airflow

CAUTION

For proper cooling and airflow, always install all access covers before turning on the system.
Operating the system for longer than five minutes without the covers in place can cause overheating and damage to system components.

2.8 Battery

CAUTION

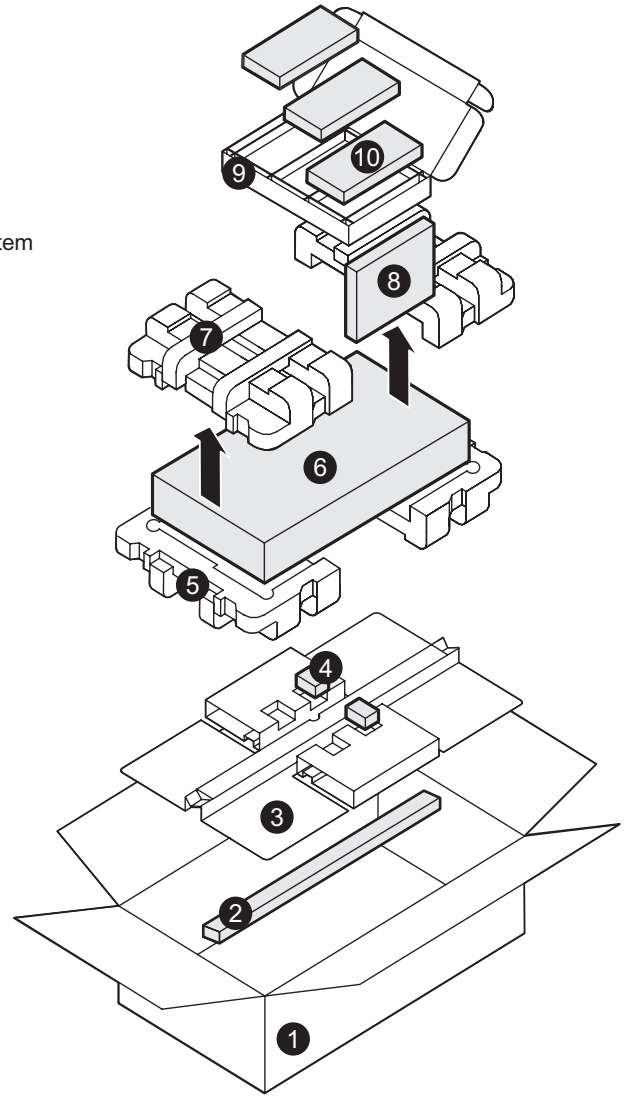
Risk of explosion if battery is replaced by an incorrect type.
Dispose of used batterries according to the instructions.

3. System Installation

3.1 Preparing for Setup

3.1.1 Unpacking

① Main Box
② Slide Rail Box
③ Heatsink Pad
④ Heatsink Box
⑤ System Bottom Cushion
⑥ XtremeServer 3326 System
⑦ System Top Cushion
⑧ Accessory Box
⑨ PSU Box
⑩ Power Supply Unit



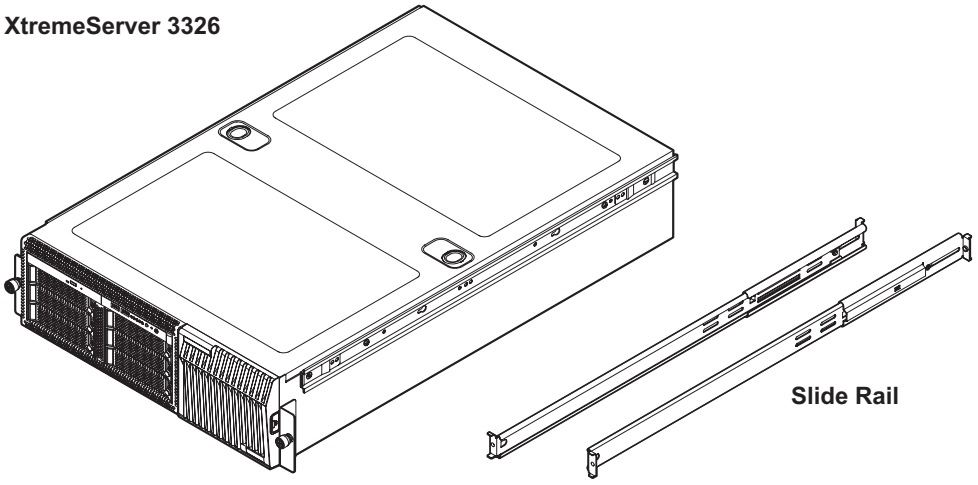
CAUTION

In setting the product out of the box, hold it in the middle and not the cushion.
Depending on the weight of the product, two people together should lift it.

3.1.2 Packing List

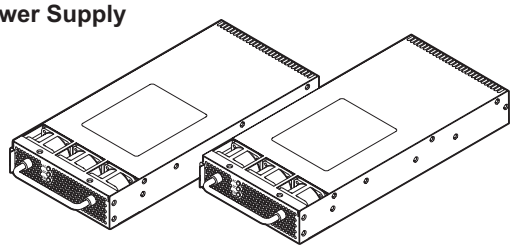
Unpack the package and check if all items listed below are present.
If any item contained in the package is damaged or missing, please contact your local dealer for replacement. In addition, keep the box and packing materials for possible future use.

XtremeServer 3326

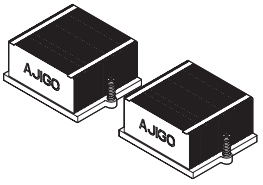


Slide Rail

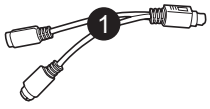
Power Supply



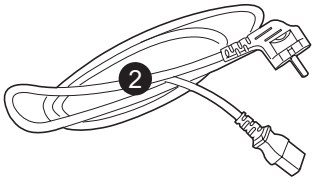
CPU Heatsink



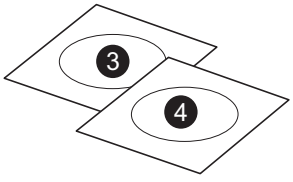
Accessory Box



① PS/2 Y-Cable



② Power Cord(Optional)



③ Manual and Driver CD
④ ServerDome(Optional)

3.1.3 Environmental Specifications

Place

In front of the system, minimum 25" of the space is needed for using and managing the system.
In rear of the system, minimum 30" of the space is needed for managing the system and airflow.

Power supply

Before installing the system, check the power capacity of the place where the system is installed.

Grounding

The system should be grounded.

Temperature

The system should be installed where the airflow and temperature is proper.
If the system is installed in the rack, the temperature in rack should be less than 35 degree Celsius.
In most case, the temperature of the rack is higher than that of the out of the rack.

Airflow

Since the airflow of the system is front-to-rear, please do not cover of the system.

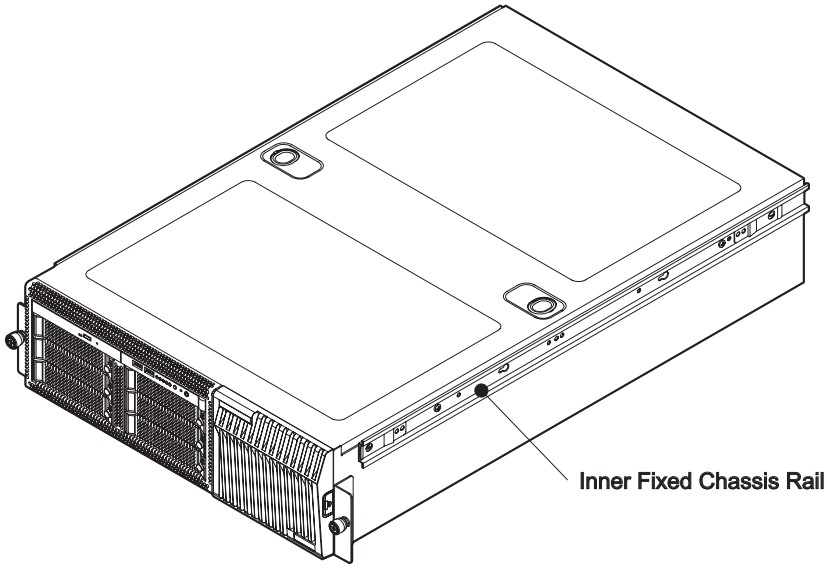
3.1.4 Install Rail for Mounting the System on the Rack

This section provides information on installing the system into a rack unit with the slide rails provided.

Slide Rail

Slide rails consist of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed slide rail that secures directly to the rack itself.

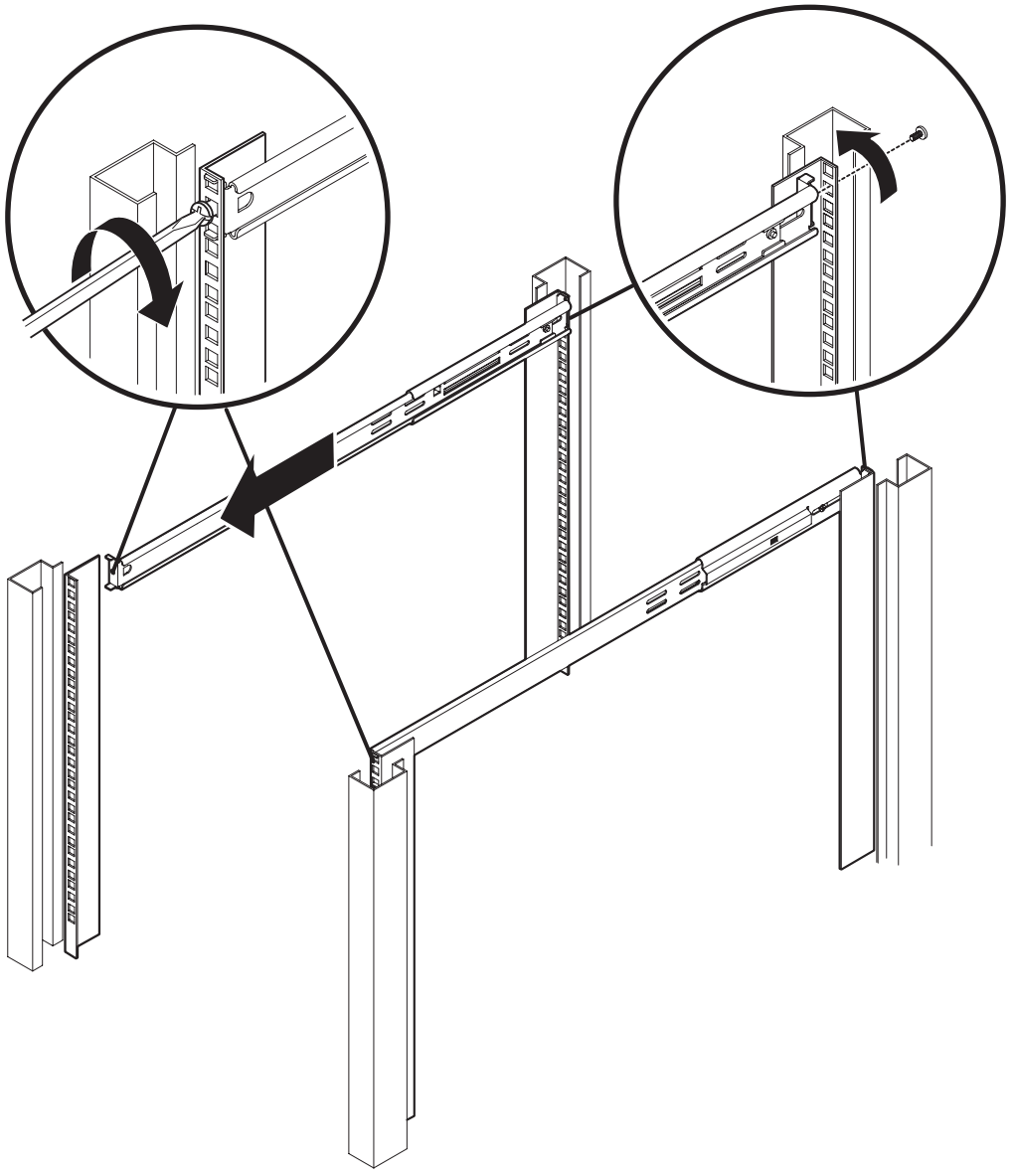
You should have received outer slide rails in the rack mounting kit.
(See packing list) And, both the left and right side inner rails have been pre-attached to the chassis.



Installing the Outer Rails

As shown in picture below, put the rear of outer rail on right place of the rear-mounting frame, and fit it on the front-mounting frame.

You can fit the outer rails on the rack very easily and then eventually you can reduce the assembly time. Finally, secure it with M6 screws.



3.1.5 Install System at the Rack Cabinet

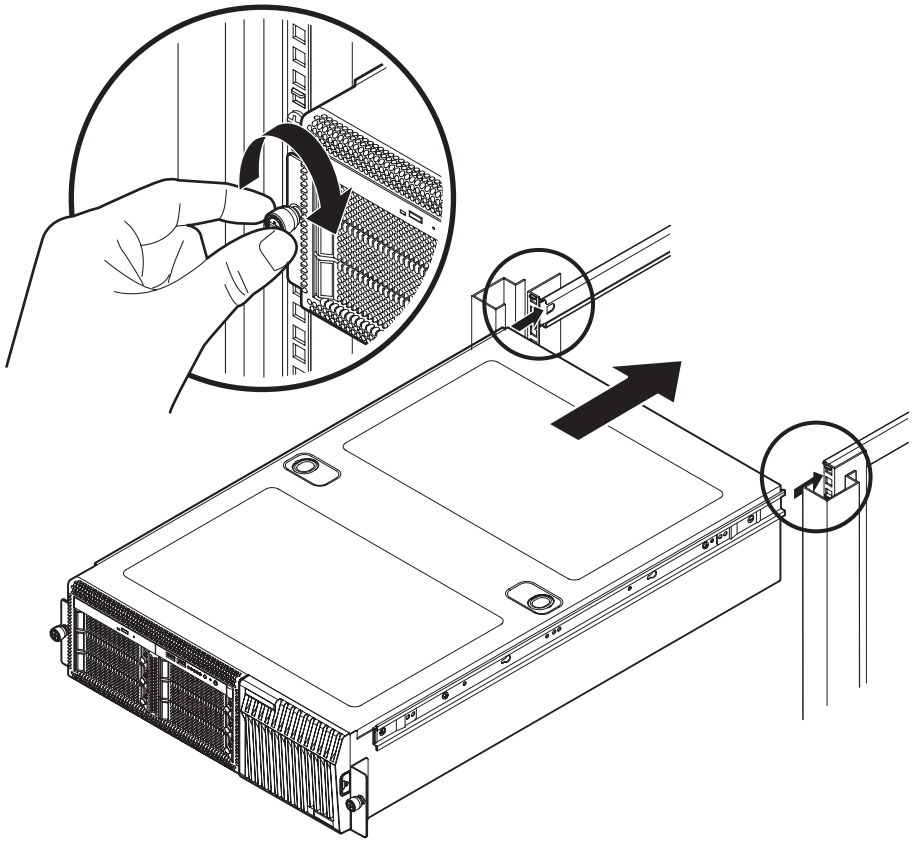
CAUTION

Remove all the cables from system before installing.

CAUTION

System can be heavy. To reduce the risk of personal injury or damage to the equipment, get help to lift and stabilize the system during installation or removal, especially when the system is not fastened to the rails.

① Lift the system to slide of rack
② Set the system on the slide rail of rack
③ Slide the system into the rack
④ Secure the system with thumbscrew on the rack.
⑤ Pull it out, pressing both levers on the inner slide rails simultaneously



3.2 Installing User Serviceable Component

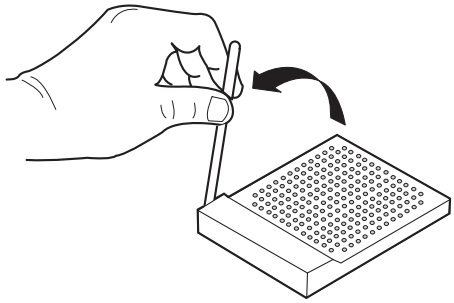
3.2.1 CPU

System mainboard accommodates AMD Opteron™ micro-PGA Socket 940 processors at 2000 MT (Mega Transfer per second). You must insert a CPU into CPU socket 0 (CPU0) first before installing one in CPU socket 1 (CPU1). The correct CPU installation sequence is CPU0, CPU1, CPU2, CPU3.

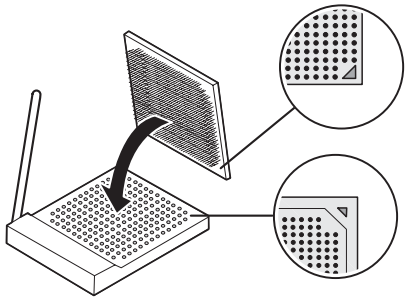
CAUTION
If you are using 3346VA-01, 3346ES-01 model, you must surely use two or four CPU for appropriate operation.

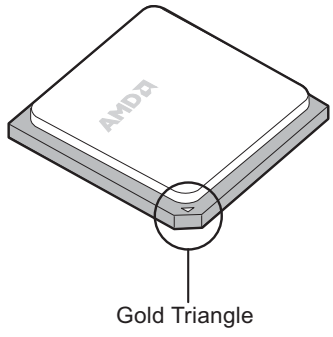
Follow these instructions to install the CPU.

① The socket-locking lever must be raised (Pull out slightly, and then lift up).

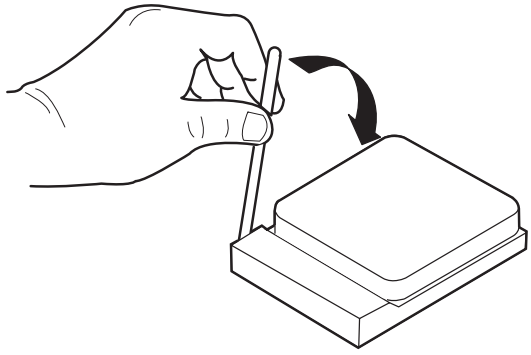


② Locate the pin 1 of the CPU socket and pin 1 of the CPU.
(Marked by a triangular hole in the Pin 1 corner)





③ Lower the locking lever and latching it into the fully locked position.



3.2.2 Memory

The system mainboard uses Dual Inline Memory Modules (DIMM). Two pair's banks are available; each bank supports one CPU with Hyper Transport Technology. The memory DIMMs accommodates PC2100/2700/3200(DDR266/DDR333/DDR400) and Double Data Rate Memory (DDR) memory modules in 128MB, 256MB, 512MB, 1GB, and 2GB, 4GB combinations. Total memory size for one mainboard is up to 64GB.

CAUTION

The system mainboard has strict memory type and timing requirements.
Before you purchase DDR (Double Data Rate) memory for using in the system mainboard, you should contact your local reseller for a recommend list of system memory that has been validated on this system. It only supports registered memory, not supports unbuffered type memory.

CAUTION

To take advantage of the 128-bit interface, you must install DIMMs in pairs of two. DIMM0 and DIMM1 are paired; DIMM2 and DIMM3 are paired; DIMM4 and DIMM5 are paired; and slots DIMM6 and DIMM7 are paired. If you are only installing two DIMMs into a Memory Bank, it is recommended that you install them in slots DIMM6 and DIMM7 to get the full bandwidth.

NOTICE

When eight dual-rank DIMMs per CPU are populated, the memory clock is degraded to one step lower clock speed. It is limitation of AMD Opteron™ processors. For example, when eight dual-rank DDR400 DIMMs are populated, DIMMs will run at 333MHz.
In case of eight single-rank or six or fewer DIMMs, the memory will run at their own clock speed.

NOTE

For optimal dual-channel DDR operation, installing DIMMs in pair is highly recommended. For two DIMMs per CPU, install them far from the CPU. For four or more DIMMs per CPU, install them close to the CPU. This is related to 8 DIMM design timing margin issue.

Memory Configuration Chart

Note : X indicates a populated DIMM Slot, The chart below does not included all the configuration

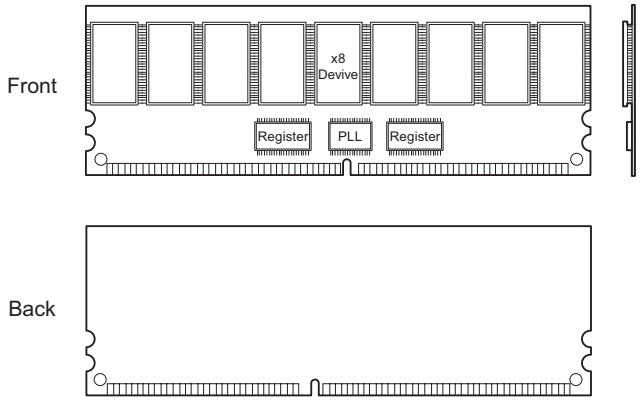
	CPU 0								CPU 1							
	DIMM 0	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7	DIMM 0	DIMM 1	DIMM 2	DIMM 3	DIMM 4	DIMM 5	DIMM 6	DIMM 7
128bit memory support							x	x							x	x
	x	x	x	x					x	x	x	x				
	x	x	x	x					x	x	x	x	x	x		
	x	x	x	x	x	x	x	x							x	x
							x	x	x	x	x	x				
	x	x	x	x	x	x			x	x	x	x				
							x	x	x	x	x	x	x	x	x	x
	x	x	x	x											x	x
64bit memory support							x								x	
					x		x						x		x	
			x		x		x				x		x		x	
	x		x		x		x		x		x		x		x	
							x				x		x		x	
					x		x				x		x		x	
	x		x		x		x						x		x	

NOTICE

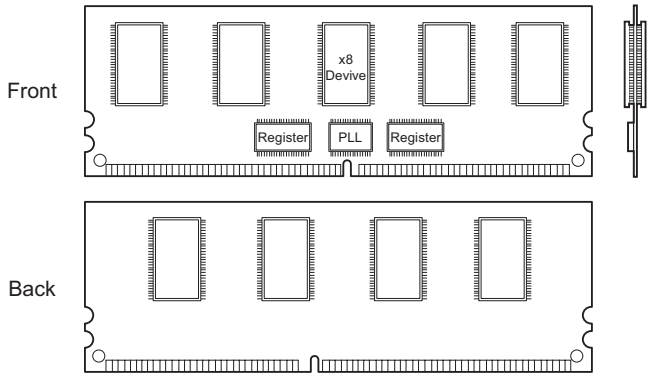
How do we distinguish between single-rank and double-rank registered DDR DIMM Modules?
Both x4 and x8 registered DIMMs come in single-rank (single-sided) and double-rank (double-sided) configurations. A single-rank x8 ECC DDR DIMM has 9 devices on the module and comes in two different styles. A double-rank x4 ECC DDR DIMM has 36 devices in a stacked configuration on the module. Both the double-rank x8 ECC DDR DIMM modules and single-rank x4 ECC DDR DIMM modules have 18 devices making them difficult to distinguish between (see Table).

Module Type	x4 DIMM	x8 DIMM
Single-rank (single-sided)	18	9
Double-rank (double-sided)	36 (stacked)	18

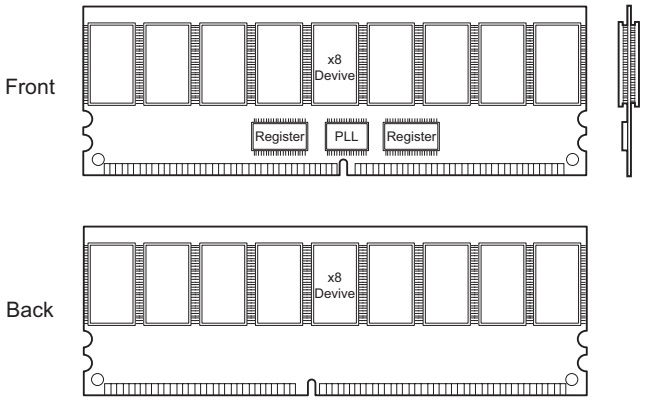
(Example 1) 184-Pin Single-Rank x8 ECC DDR SDRAM DIMM



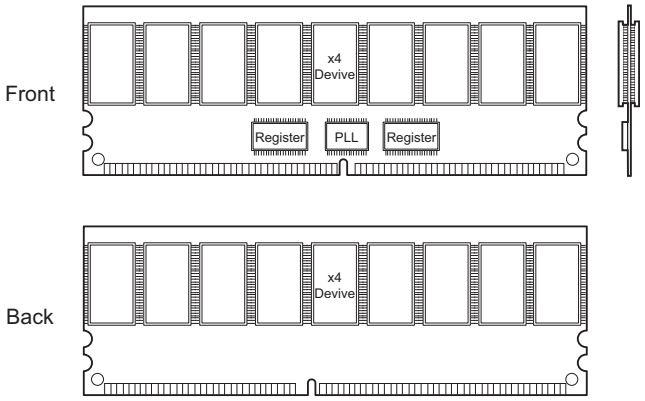
(Example 2) 184-Pin Single-Rank x8 ECC DDR SDRAM DIMM



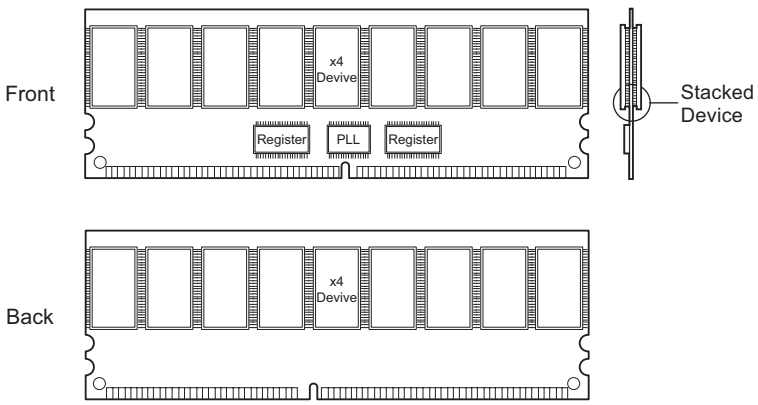
(Example 3) 184-Pin Double-Rank x8 ECC DDR SDRAM DIMM



(Example 4) 184-Pin Single-Rank x4 ECC DDR SDRAM DIMM

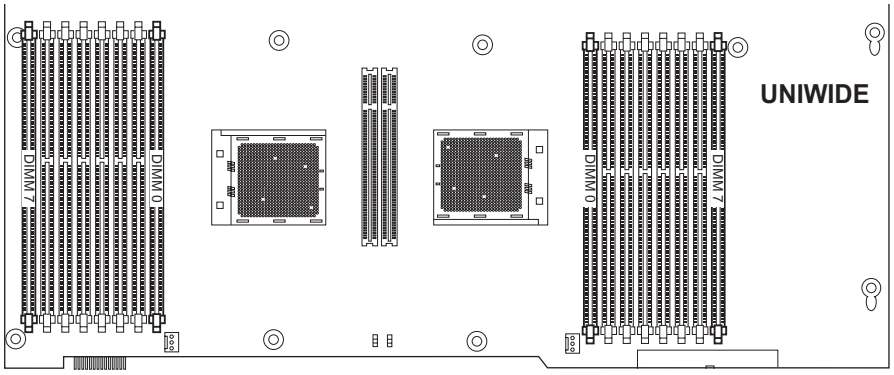


(Example 5) 184-Pin Double-Rank x4 ECC DDR SDRAM DIMM

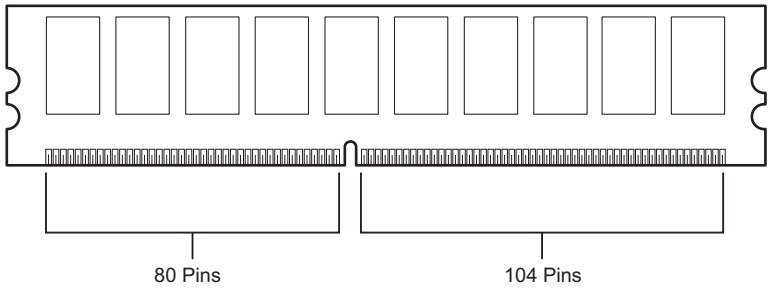


3.2.2.1 Memory Installation Procedure

① Locate the DIMM modules



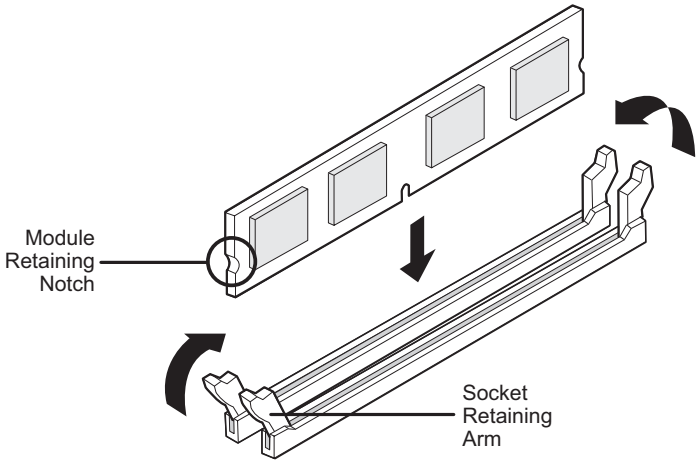
② Make sure the DIMM's pins are facing down, and check that the pin arrangement on the memory module resembles the one pictured below.

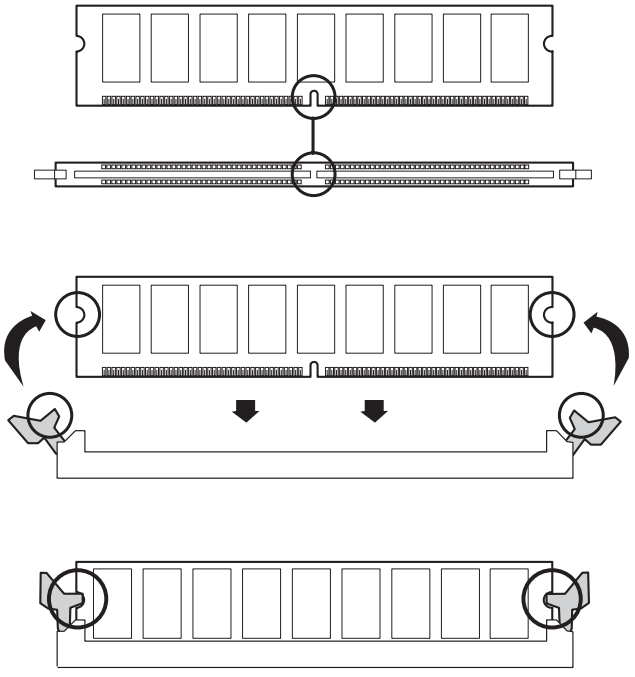


CAUTION

Always populate H0 DIMM socket before installing memory modules in the H1 DIMM sockets.

③ Insert the module into the socket and press down evenly on both ends firmly until the DIMM is securely in place. (The tabs of the DIMM socket will close-up to hold the DIMM in place when the DIMM is properly installed into the socket.)

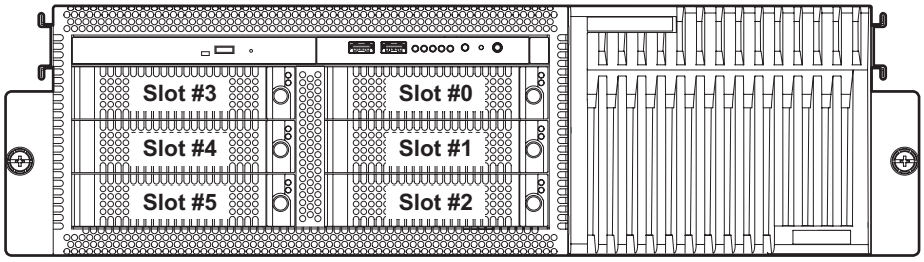




3.2.3 Hard Disk Drives

NOTICE

When you install hard disk drive into the system, we recommend using slot #0 first.



HDD ID Configuration

HDD Type	Slot #5	Slot #4	Slot #3	Slot #2	Slot #1	Slot #0
SATA	ID 6	ID 5	ID 4	ID 3	ID 2	ID 1
SCSI	ID 5	ID 4	ID 3	ID 2	ID 1	ID 0

3.2.4 PCI Add-on Cards

WARNING

Please power off your power supply completely when adding removing any expansion card or other system components. Failure to do so may cause severe damage to both your motherboard and expansion card.

WARNING

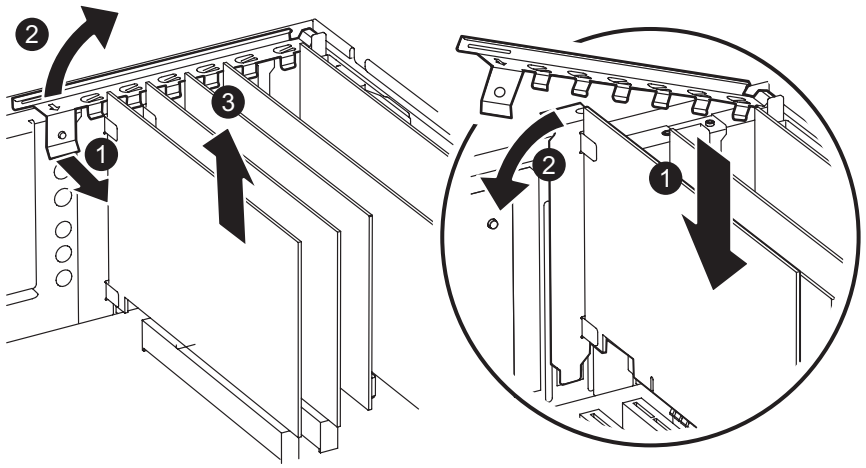
Please again check add-on card type when adding expansion card to slot.
PCI-X slot can't support exclusive 5V add-on card.

3.2.4.1 Expansion Card Installation Procedure

① Release the latch by pulling towards the front and rotate it.

② Install PCI card to the system.

③ Rotate the latch back into the original position to lock.



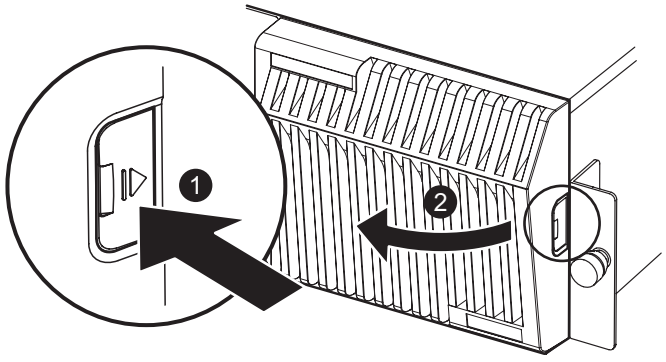
3.2.5 Power Module Hot Plugging

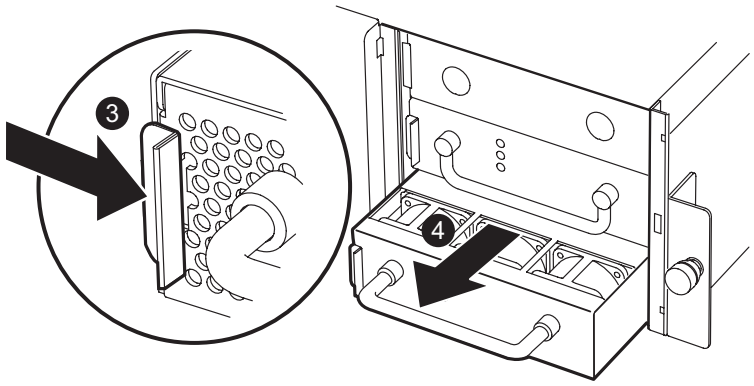
WARNING

If removing a power supply, release the locking latch of the power supply.

① Press the release button on the side of the front bezel, and take the bezel away from the system.

② Release the latch hook and pull the power supply out of the system.





4. BIOS and Jumper Setup

4.1 BIOS

This chapter discusses the AMI BIOS Setup program built into the ROM BIOS. The Setup program allows users modifying the basic system configurations according to their requirements. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.
The AMI BIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. The BIOS provides critical low-level support for standard devices such as disk drives and serial ports. The AMI BIOS has been customized by adding important, but non-standard, features such as password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.
The rest of this chapter is intended to guide you through the process of configuring your system using Setup.

4.1.1 Starting BIOS Setup

The AMI BIOS is immediately activated when you power on the computer every time.
The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. After finishing configuring the whole system, then BIOS will continue to seek an operating system on one of the disks, launch then turn control over to the operating system.
While the AMI BIOS is in control, the Setup program can be activated in the way:
By pressing the <DEL> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

4.1.2 Updating BIOS Setup

Creating a bootable floppy disk

A. DOS environment

Insert a 1.44 MB floppy disk into the drive.

At the DOS prompt, type:

format A : /S then press <Enter>.

B. Microsoft® Windows® environment(Microsoft® Windows® 95/98 only)

Insert a 1.44 MB floppy disk into the floppy disk drive.

From your Windows desktop, click on Start, then select My Computer.

Select the 3 1/2 Floppy Drive icon.

Click File from the menu, and then select Format. A Format 3 1/2 Floppy Disk window appears.

If you are using Windows™, select "Create an MS-DOS startup disk" from the format options field, then click Start.

Move the latest BIOS file to the bootable floppy disk.

Using *"NVFLSHSC.EXE"* to update the BIOS

Update the BIOS using the NVFLSHSC.EXE utility in DOS environment.
At the DOS prompt, type the command line:
NVFLSHSC <filename>
where "filename" means the latest (or original) BIOS file that you copied to the bootable floppy disk.
The screen displays the status of the update process.

NOTICE

The BIOS information on the screen is for reference only.
What you see on your screen may not be exactly the same as shown.

CAUTION

DO NOT shutdown or reset the system while updating the BIOS! Doing so may cause system boot failure!

When the BIOS update process is complete, the utility returns to the DOS prompt.

The AMI BIOS is immediately activated when you power on the computer every time.
The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. After finishing configuring the whole system, then BIOS will continue to seek an operating system on one of the disks, launch then turn control over to the operating system.

While the AMI BIOS is in control, the Setup program can be activated in the way:

By pressing the <DEL> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press <DEL> to enter SETUP

4.1.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, press <Esc> to quit. The following table provides more details about how to navigate in the Setup program using the keyboard.

Key	Function
Up Arrow(↑) Key	Move to the previous item
Down Arrow(↓) Key	Move to the next item
Left Arrow(←) Key	Move to the previous item
Right Arrow(→) Key	Move to the next item
Esc key	In the Submenu: Exit the submenu. In the BIOS main category: Quit Without saving changes.
Enter Key	Select the item. A pop-up selection will display on the screen to set the item value.
PgUp Key	Previous page on Scrollable menus or jump to the first interactive item listed.
PgDn Key	Next page on Scrollable menus or jump to the last interactive item listed
F1 Key	General Help on Setup navigation keys. Press <F1> key to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <ESC> key or <F1> key again.
F2/F3 Key	Change colors
F7 Key	Discard changes
F8 Key	Load failsafe defaults
F9 Key	Load optimal defaults
F10 Key	Save and Exit
Home	Go to top of screen
End	Go to bottom of screen
Esc	Exit

NOTICE

The BIOS does NOT automatically save values that you have modified. If you do not save your values before you exit the BIOS Setup Utility, all your changes will be lost.

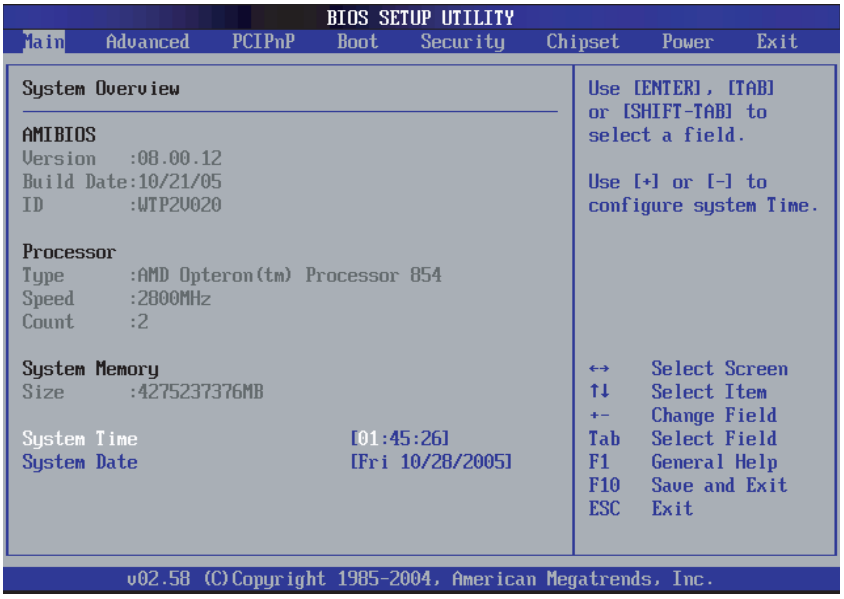
If after making and saving system changes with the BIOS Setup Utility, you discover that your computer is no longer able to boot, the AMI BIOS supports an override, which will reset your system to the Failsafe defaults. If that fails, it is possible to manually clear the present CMOS information through the "Clear CMOS Header" on the motherboard (Refer to Jumper Settings for more information).

The best advice is to ONLY alter settings which you thoroughly understand. The default settings have been carefully chosen by AMIBIOS to provide the maximum system performance and reliability.

Even a slight change to the chipset setup may cause potential and unpredictable failure to the system.

4.1.4 Main Menu

This is the first screen that is displayed when you enter the BIOS Setup Utility.
Each tab lined on the top of the screen represents each different menu. The following picture shows the main menu. Main menu shows the information of BIOS version, date and ID; processor type, speed and count; system size. In addition, system time and date is adjustable using + / - key or number keys.

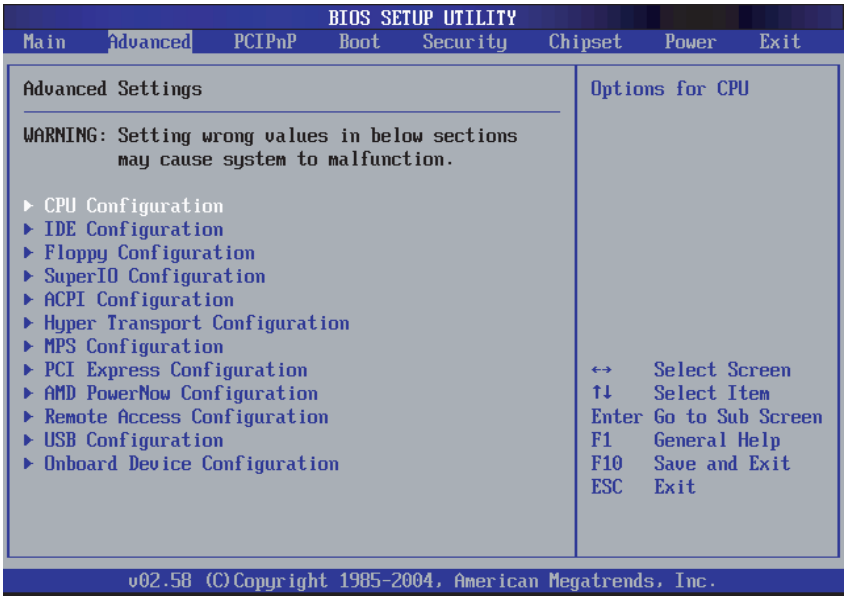


NOTICE

You can check the BMC F/W version on the post and in the BIOS setup utility

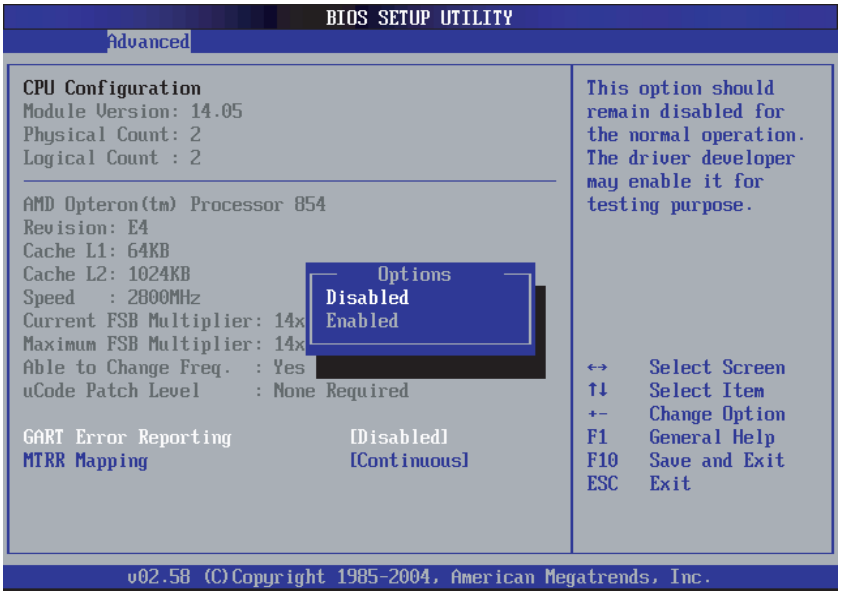
4.1.5 Advanced Menu

You can make these modifications on the advanced menu.



4.1.5.1 CPU Configuration Submenu

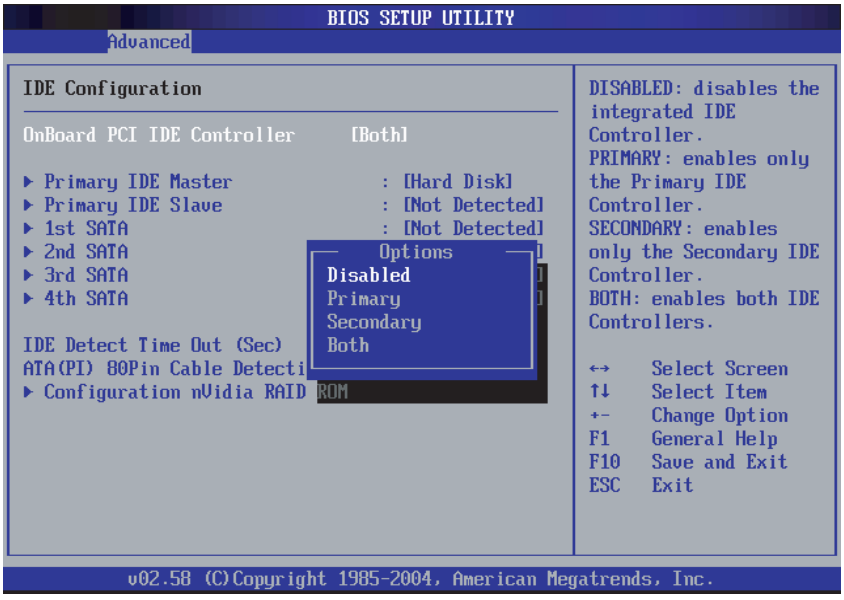
In CPU configuration, you can set up CPU frequency and enable/disable the Error Reporting. GART error reporting should remain disabled for the normal operation.



Feature	Options	Description
GART Error Reporting	Disable Enable	This option should remain disabled for the normal operation. This driver developer may enable it for testing purpose.
MTRR Mapping	Continuous Discrete	This option determines the method used for programming CPU MTRRs when 4GB or more of memory is present. Discrete leaves the PCI hole below the 4GB boundary undescribed. Continuous explicitly describes the PCI hole as non-cacheable.

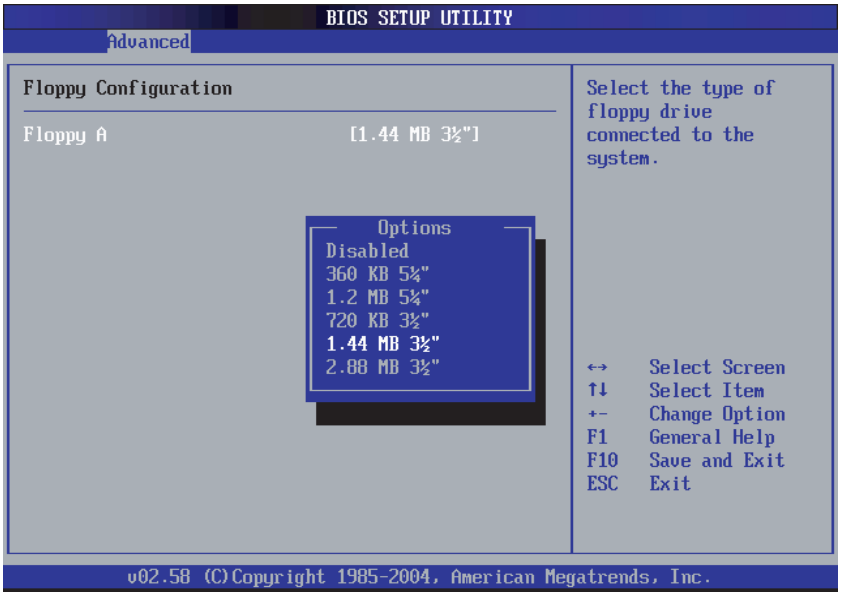
4.1.5.2 IDE Configuration Submenu

You can make the selections on IDE Configuration menu.



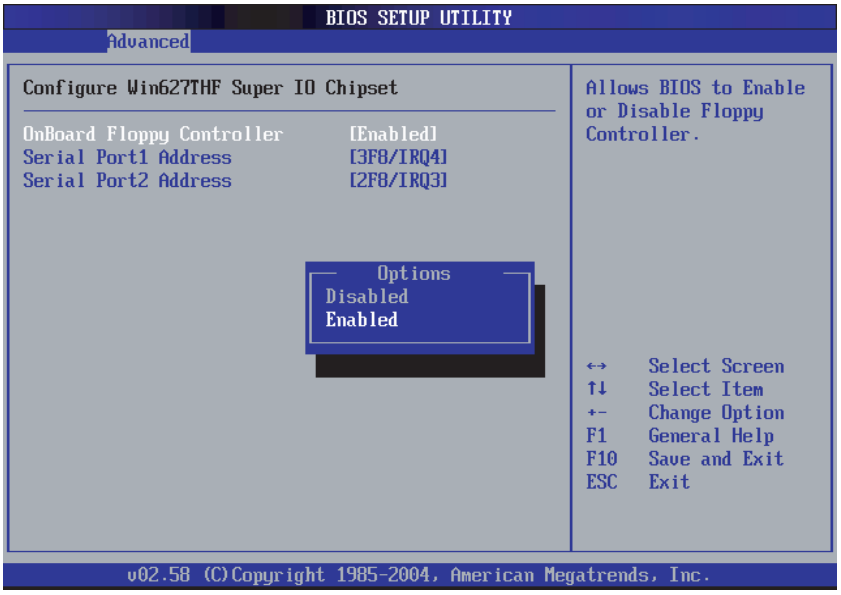
Feature	Options	Description
OnBoard PCI IDE Controller	Disable Primary Secondary Both	Disable: disable the integrated IDE controller Primary: enable only the Primary IDE controller Secondary: enable only the Secondary IDE controller Both: enable both IDE controllers.
IDE Detect Time out (sec)	0, 5, 10, 15, 20, 25, 30, 35	Select the time out value for detecting ATA/ATAPI device
ATA (PI) 80Pin Cable Detection	Host & Device Host Device	Select the mechanism for detecting 80 pin cable
Configuration nVidia RAID ROM	Disabled Enabled	Disable/enable nVidia ROM.

4.1.5.3 Floppy Configuration Submenu



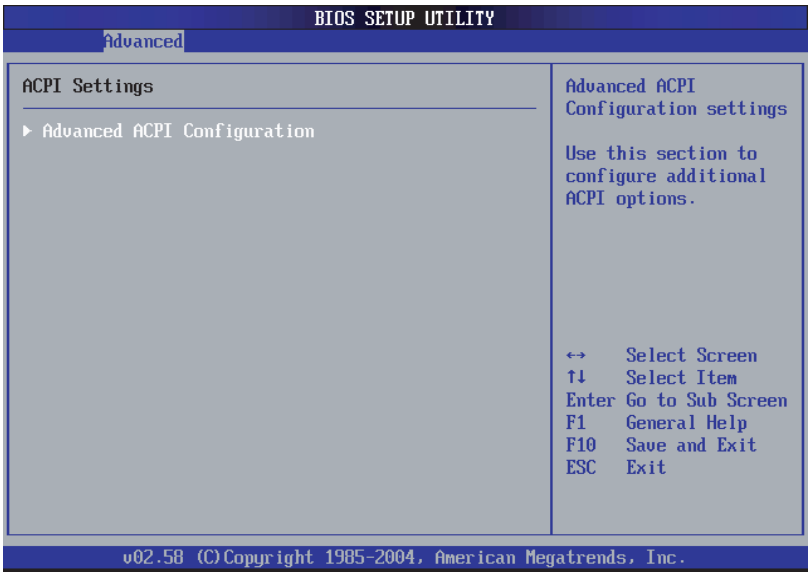
Feature	Options	Description
Floppy Configuration	Disabled 5 1/2" 360 KB 5 1/2" 1.2 MB 3 1/2" 720 KB 3 1/2" 1.44 MB 3 1/2" 2.88 MB	Select Floppy A or Floppy B and then selects floppy-diskette type installed in your system.

4.1.5.4 Super IO Submenu



Feature	Options	Description
OnBoard Floppy Controlle	Disabled Enabled	Allows BIOS to Enable or Disable Floppy Controller.
Serial Port1 Address	Disabled 3F8/IRQ4 3E8/IRQ4 2E8/IRQ3	Allows BIOS to Select Serial Port1 Base Addresses.
Serial Port2 Address	Disabled 2F8/IRQ3 3E8/IRQ4 2E8/IRQ3	Allows BIOS to Select Serial Port1 Base Addresses.

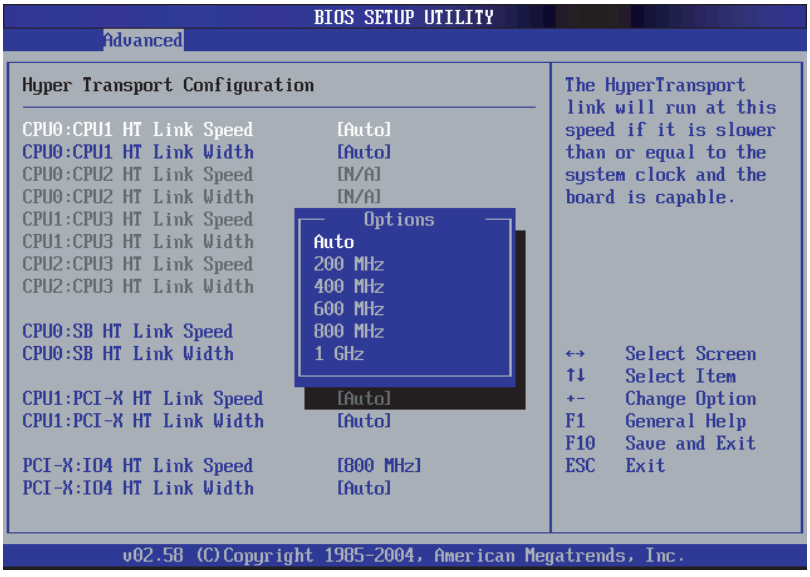
4.1.5.5 ACPI Configuration Submenu



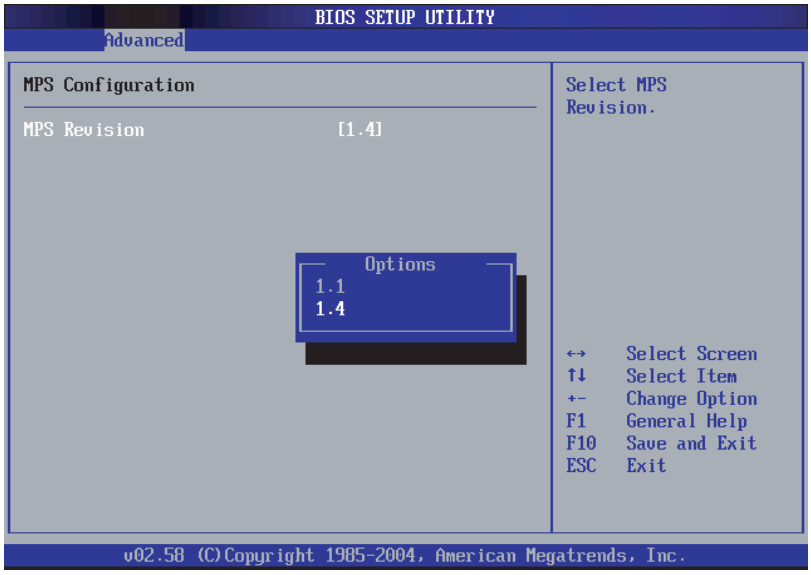
Feature	Options	Description
ACPI Configuration	ACPI Aware O/S Yes/No	Enable: O/S supports ACPI Disable: O/S doesn't support ACPI

4.1.5.6 Hyper Transport Configuration Submenu

To set up the hyper transport speed and bandwidth, you can adjust over this menu. The incorrect manipulation will impede the system running.

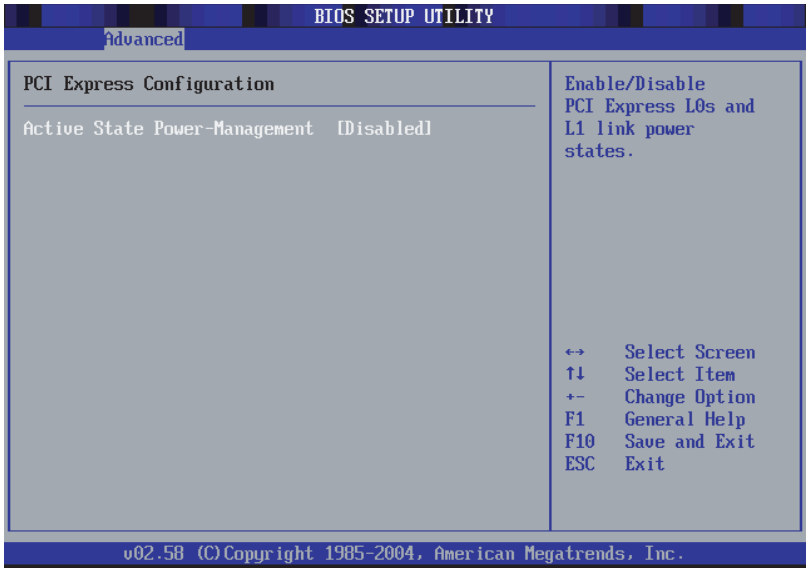

BIOS SETUP UTILITY
Advanced
Hyper Transport Configuration
CPU0:CPU1 HT Link Speed [Auto]
CPU0:CPU1 HT Link Width [Auto]
CPU0:CPU2 HT Link Speed [N/A]
CPU0:CPU2 HT Link Width [N/A]
CPU1:CPU3 HT Link Speed
CPU1:CPU3 HT Link Width
CPU2:CPU3 HT Link Speed
CPU2:CPU3 HT Link Width
CPU0:SB HT Link Speed
CPU0:SB HT Link Width
CPU1:PCI-X HT Link Speed [Auto]
CPU1:PCI-X HT Link Width [Auto]
PCI-X:IO4 HT Link Speed [800 MHz]
PCI-X:IO4 HT Link Width [Auto]
Options
Auto
200 MHz
400 MHz
600 MHz
800 MHz
1 GHz
The HyperTransport link will run at this speed if it is slower than or equal to the system clock and the board is capable.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.

4.1.5.7 MPS Configuration Submenu



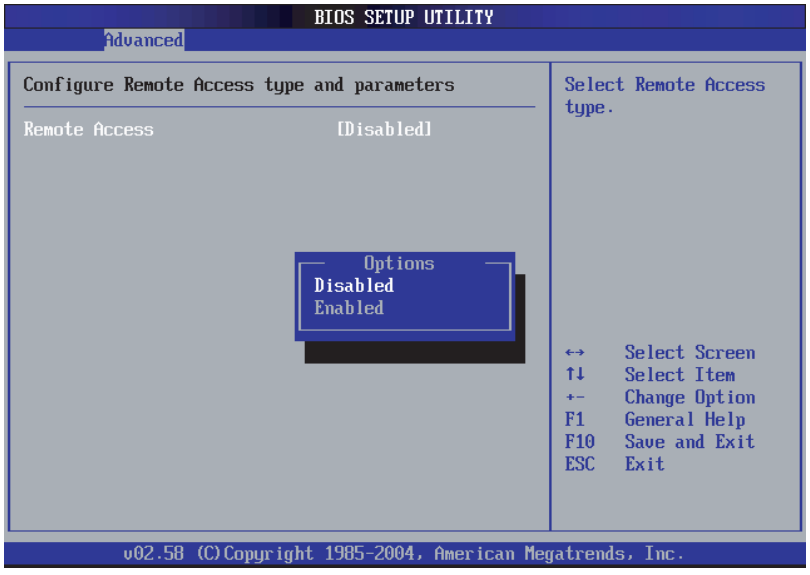
4.1.5.8 PCI Express Configuration Submenu

Enable/Disable PCI Express L0 and L1 link power states.



4.1.5.9 AMD PowerNow Configuration Submenu

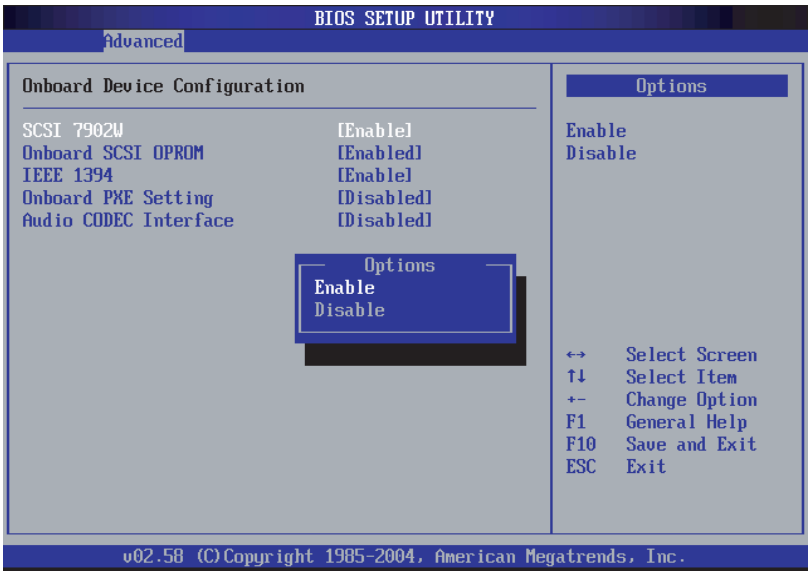
4.1.5.10 Remote Access Configuration Submenu



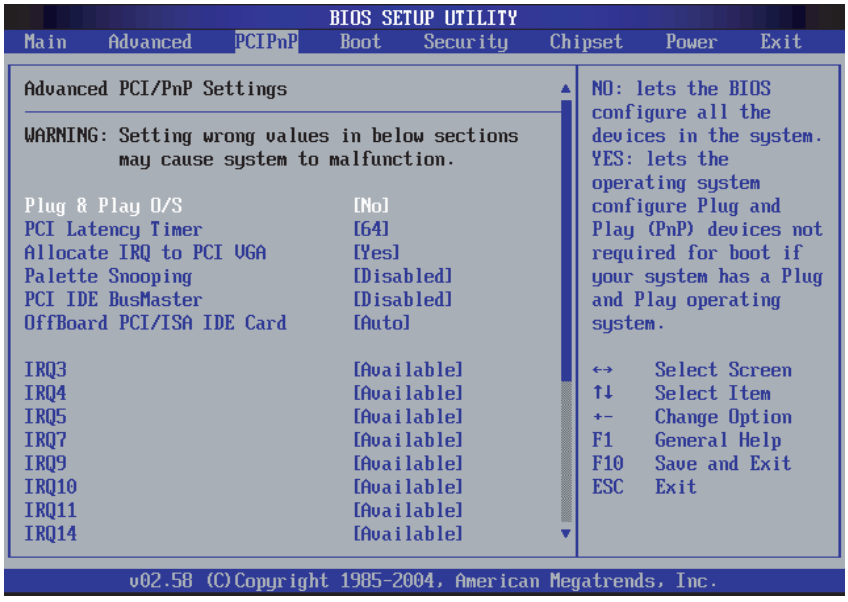
4.1.5.11 USB Configuration Submenu

Feature	Options	Description
USB Controller Support	Disabled USB 1.1 Only USB 1.1+ USB 2.0	Enables USB controller.
Legacy USB Support	Disabled/Enabled/ Auto	Enables support for legacy USB Auto option disables legacy support if no USB device connected.
USB 2.0 Controller Mode	HiSpeed FullSpeed	Configures the USB 2.0 controller in HiSpeed (480Mbps) or FullSpeed (12Mbps).
USB Mass Storage Device Configuration		Number of seconds POST waits for the USB mass storage device after start unit command.

4.1.5.12 Onboard Device Configuration Submenu



4.1.6 PCI PnP Menu


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
Plug & Play O/S [No]
PCI Latency Timer [64]
Allocate IRQ to PCI VGA [Yes]
Palette Snooping [Disabled]
PCI IDE BusMaster [Disabled]
OffBoard PCI/ISA IDE Card [Auto]
IRQ3 [Available]
IRQ4 [Available]
IRQ5 [Available]
IRQ7 [Available]
IRQ9 [Available]
IRQ10 [Available]
IRQ11 [Available]
IRQ14 [Available]
NO: lets the BIOS configure all the devices in the system. YES: lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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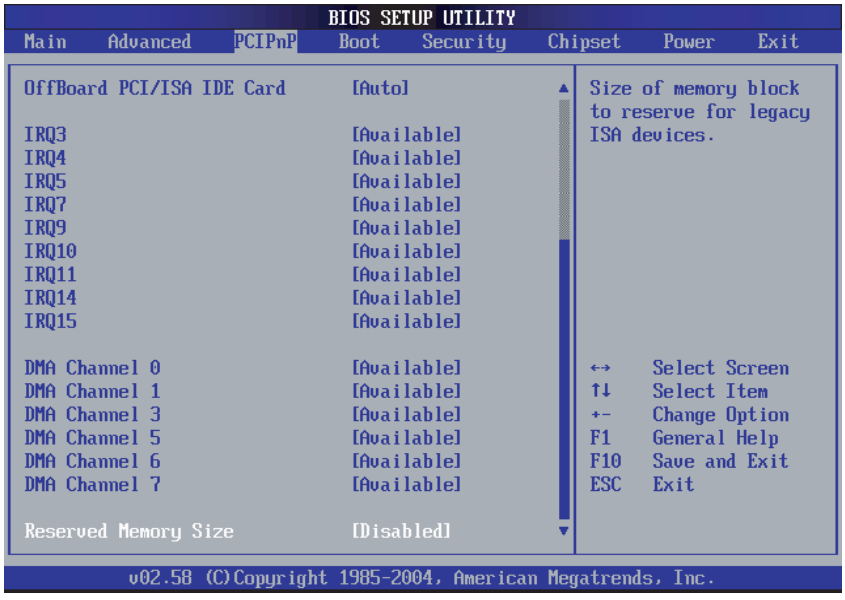
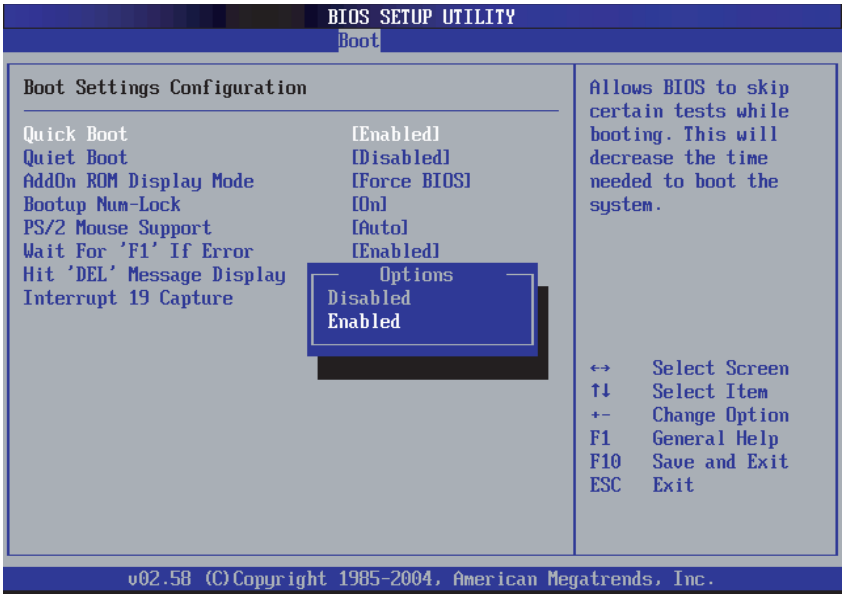
PCI PnP Menu 1



PCI PnP Menu 2

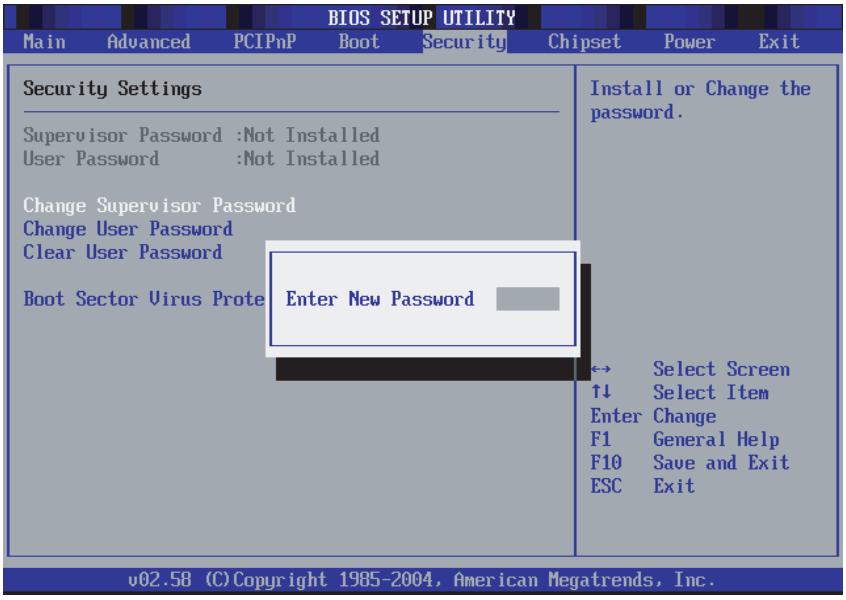
Feature	Options	Description
Plug & Play O/S	Yes No	Yes: lets the O/S configure PnP devices not required for boot if your system has a Plug and Play O/S.
PCI Latency Timer	32, 64, 96, 128, 160, 192, 224, 248	Value in units of PCI clocks for PCI device latency timer register.
Allocate IRQ to PCI VGA	Yes No	Yes: Assign IRQ to PCI VGA card if card requests IRQ. No: Doesn't assign IRQ To PCI VGA card even if card requests IRQ.
Palette Snooping	Enabled Disabled	Enabled: informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.
PCI IDE BusMaster	Enabled Disabled	Enabled: BIOS uses PCI busmastering for reading / writing to IDE drives.
Offboard PCI/ISA IDE card	Auto PCI Slot1 PCI Slot2 PCI Slot3 PCI Slot4 PCI Slot5 PCI Slot6	Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.
IRQ3~IRQ15	Available Reserved	Available: specified IRQ is available to be used by PCI/PnP devices Reserve: specified IRQ is reserved for use by legacy ISA devices
DMA Channel 0, 1, 3, 5, 6, 7	Available Reserved	Available: specified DMA is available to be used by PCI/PnP devices Reserve: specified DMA is reserved for use by legacy ISA devices
Reserved Memory Size	Disabled 16K 32K 64K	Size of memory block to reserve for legacy ISA devices

4.1.7 Boot Menu

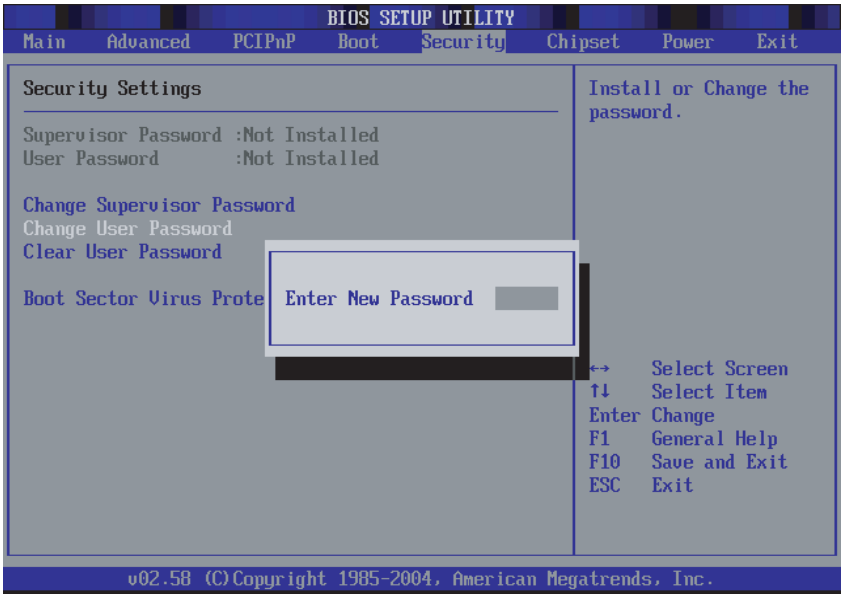


Feature	Options	Description
Quick Boot	Disabled Enabled	Allow BIOS to skip tests while booting
Quiet Boot	Disabled Enabled	Disabled: Display normal POST messages Enabled: Display OEM logo
Add-on ROM Display Mode	Force BIOS Keep Current	Set display mode for option ROM
Bootup Num-Lock	Off On	Select power on state for Num-Lock
PS/2 Mouse Support	Disabled Enabled	Select support for PS/2 mouse
Wait for " F1 " if error	Disabled Enabled	Wait for F1 key to be pressed if error occurs
Hit " DEL " Message Display	Disabled Enabled	Display " Press DEL to run Setup " in POST
Interrupt 19 Capture	Disabled Enabled	Enabled: allows option ROMs to trap interrupt 19

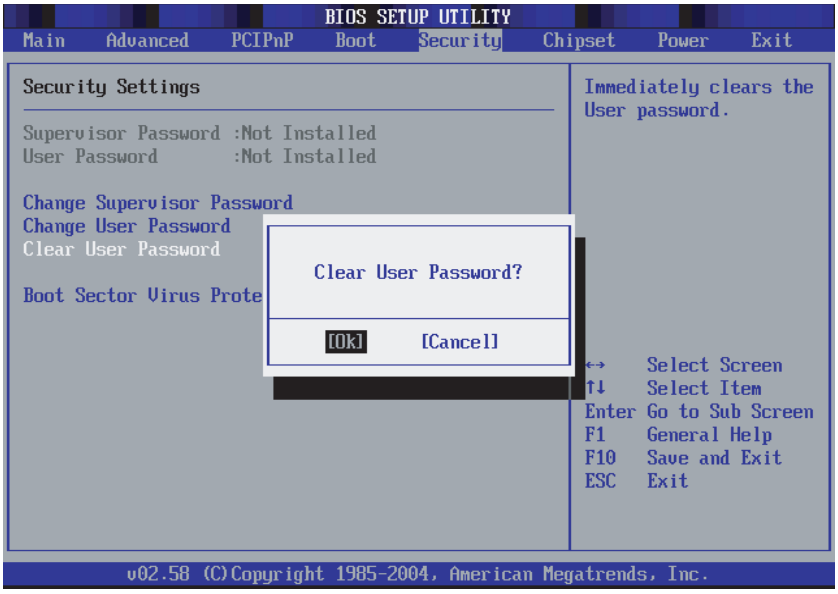
4.1.8 Security Menu



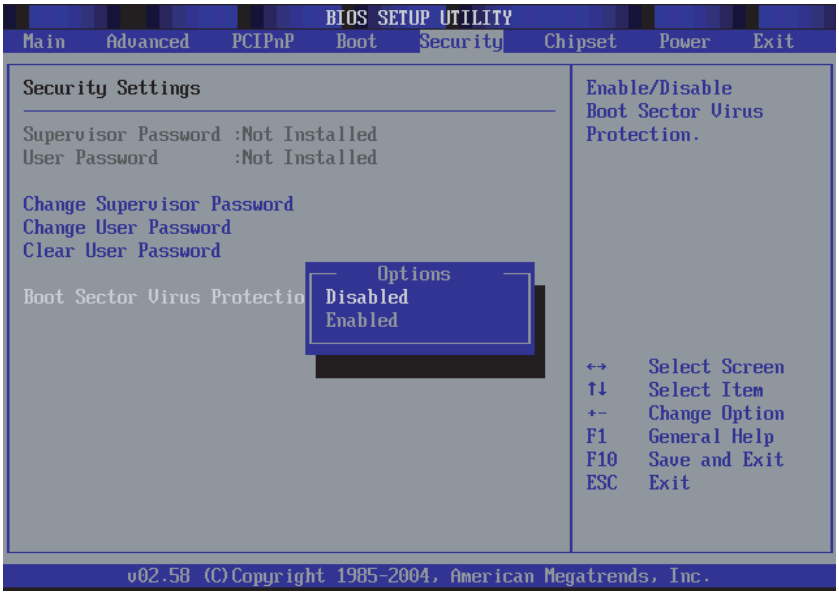
Security Menu 1: Change Supervisor Password



Security Menu 2: Change User Password



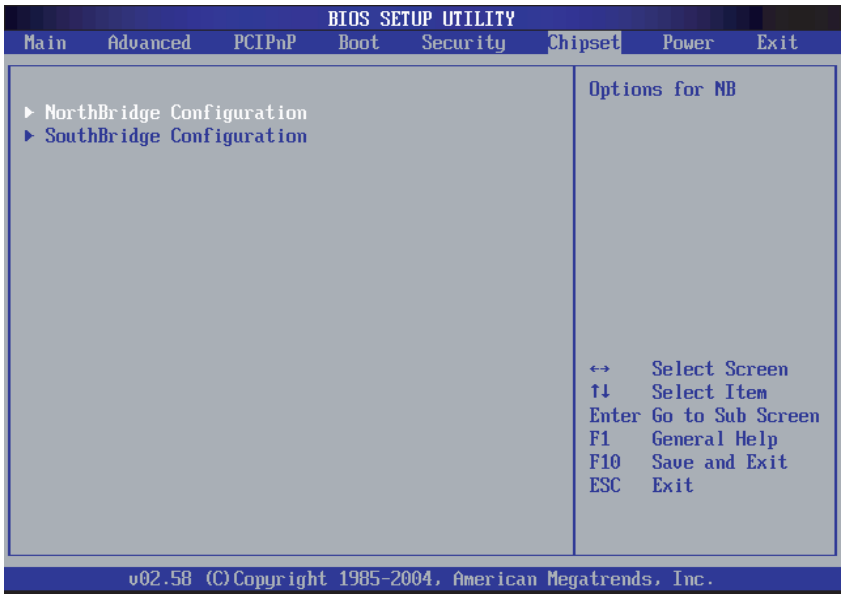
Security Menu 3: Clear User Password



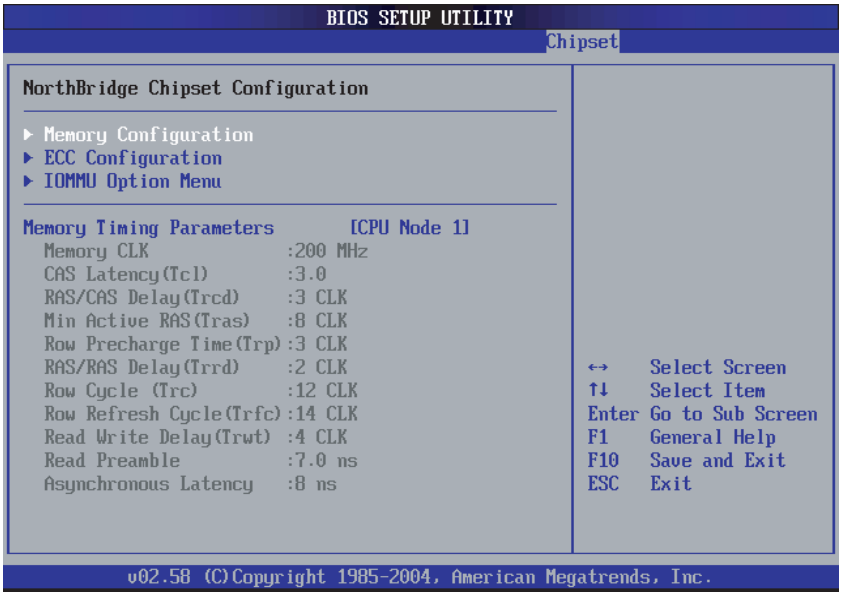
Security Menu 4: Boot Sector Virus Protection

Feature	Options	Description
Change Supervisor Password		Install or change the password
Change User Password		Install or change the password
Clear User Password		Setup: check password while invoking setup Always: check password while invoking setup as well as on each boot
Boot Sector Virus Protection	Disabled Enabled	Enable/Disable boot sector virus protection

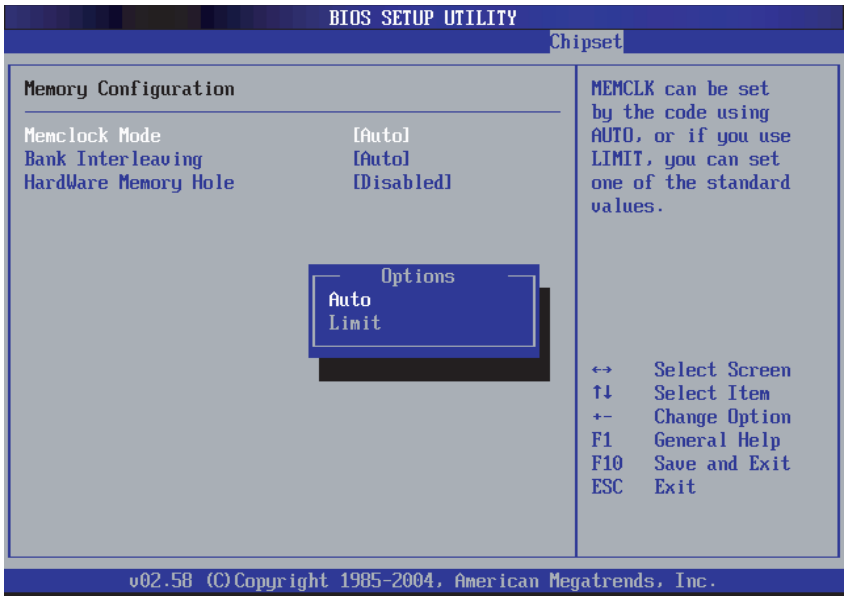
4.1.9 Chipset Configuration Menu



4.1.9.1 NorthBridge Chipset Configuration Submenu

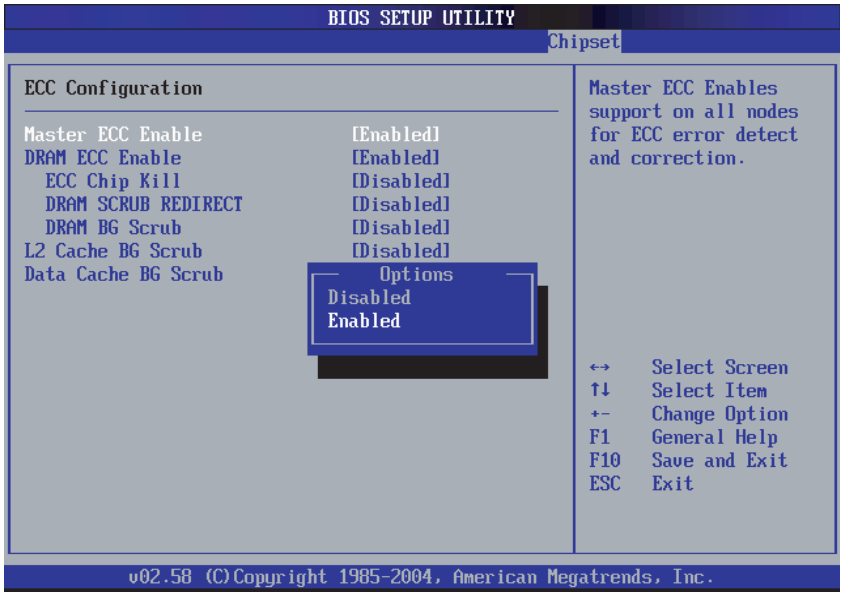


Memory Configuration Submenu



Feature	Options	Description
Memclock Mode	Auto Limit	It can be set by the code using AUTO, or if you use LIMIT, you can set one of the standards.
Bank Interleaving	Auto Disabled	Interleaving allows memory accesses to be spread out over BANKS on the same node, or across NODES, decreasing access contention
Hardware Memory Hole	Disabled Enabled	Enable Software Memory Remapping Around Memory Hole

4.1.9.2 ECC Configuration Submenu

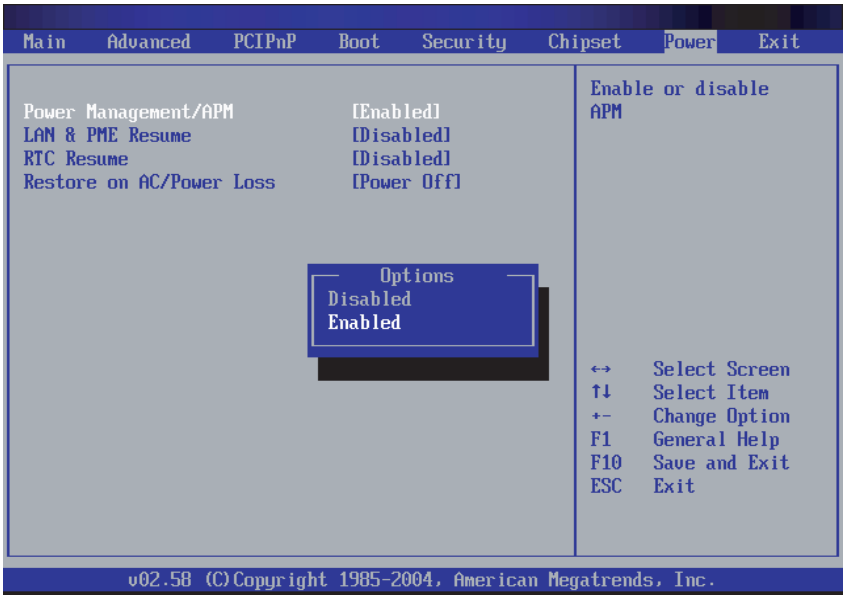


Feature	Options	Description
Master ECC Enable	Disabled Enabled	Master ECC Enables support on all nodes for ECC error detect and correction.
DRAM ECC Enable	Disabled Enabled	DRAM ECC allows hardware to report and correct memory errors automatically maintaining system integrity.
L2 Cache BG Scrub	40ns 80ns 160ns 320ns 640ns 1.28us 2.56us 5.12us 10.2us 20.5us 41.0us 81.9us 163.8us 327.7us 655.4us	Allows the L2 date cache ram to be corrected while idle.
Date Cache BG Scrub	See above	Allows the L1 date cache ram to be corrected while idle.

4.1.9.3 IOMMU Mode Submenu

Feature	Options	Description
IOMMU Mode	AGP Present Disabled 32MB 64MB 128MB 256MB 512MB 1GB	Set GART size in systems without AGP, or disable altogether. Some OSes require valid GART for proper operation. If AGP is present, select appropriate option to ensure proper AGP operation.

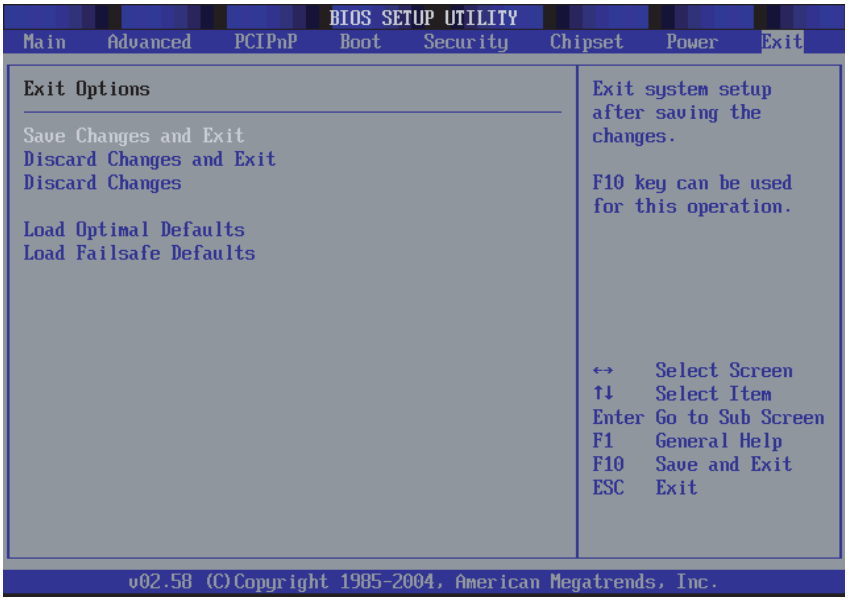
4.1.10 Power Menu



The Power menu items allow you to change the power management settings.
Select an item then press Enter to display the configuration options.

Feature	Options	Description
Power Management / APM	Disabled Enabled	Enable or disable APM
LAN & PME Resume	Disabled Enabled	Enabled or disabled Internal 802.3 MAC to generate P.M.E in SoftOFF.
RTC Resume	Disabled Enabled	Disabled/Enabled RTC event to wake after a power failure
Restore on AC / Power Loss	Power Off Power On Last State	Power Off Power On Last State

4.1.11 Exit Menu


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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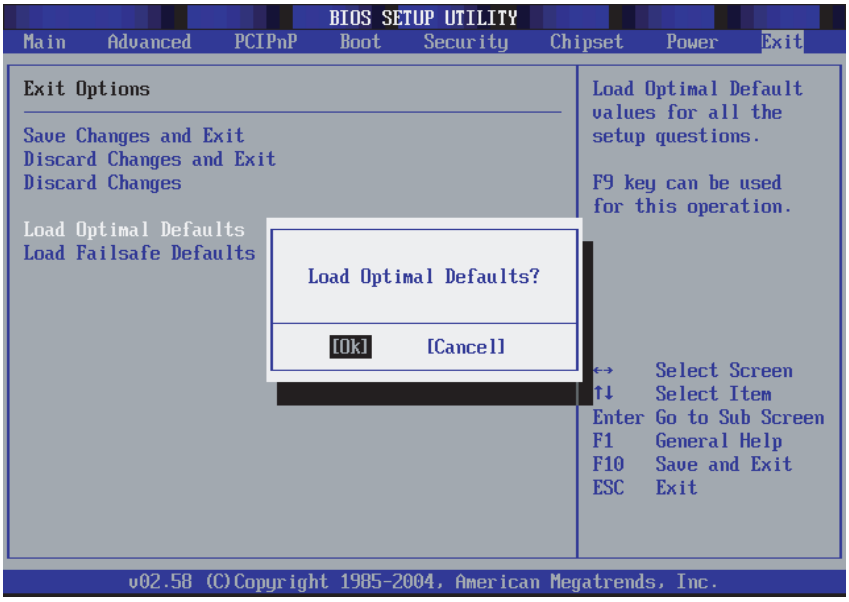
Feature	Description
Save Changes and Exit	Exit system setup after saving the changes F10 key can be used for this operation
Discard Changes and Exit	Exit system setup without saving the changes ESC key can be used for this operation
Discard Changes	Discard changes done so far to any of the setup question F7 key can be used for this operation
Load Optimal Defaults	Load optimal default values for all the setup questions F9 key can be used for this operation
Load Failsafe Defaults	Load Failsafe default values for all the setup questions F8 key can be used for this operation

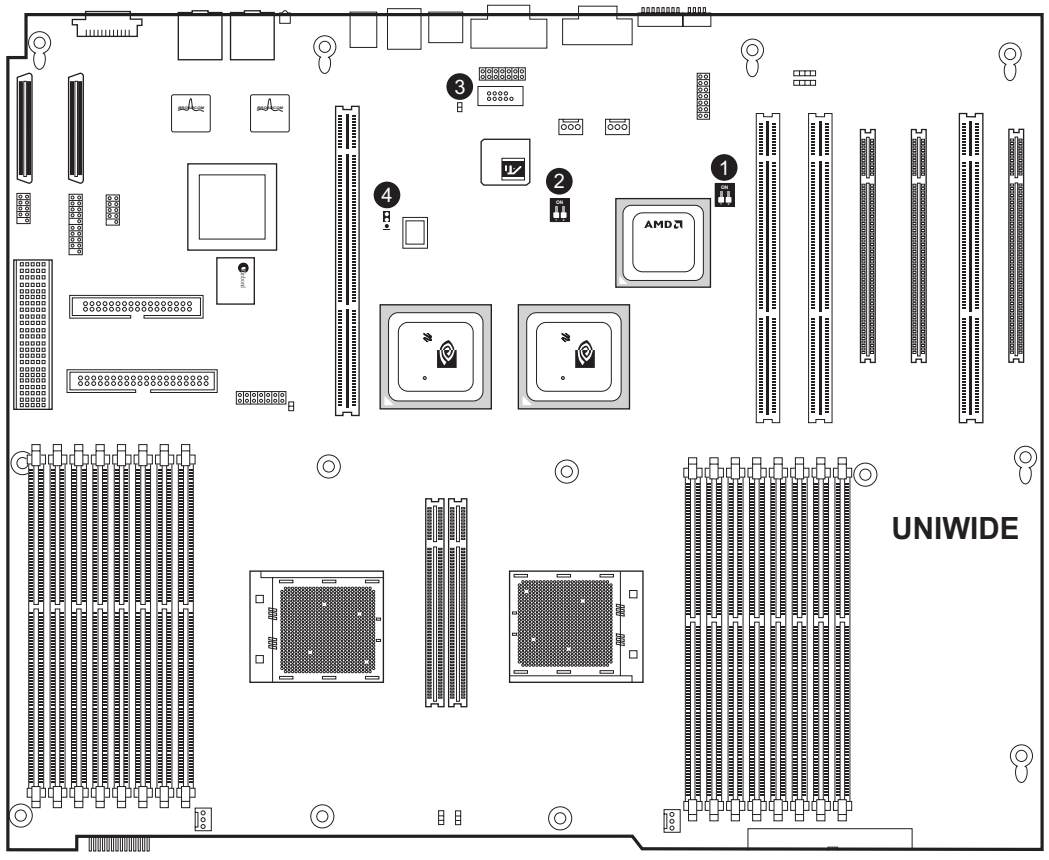
NOTICE

Any wrong values setting may cause system to malfunction. Therefore, APPRO suggests loading optimal defaults while any error happens.


BIOS SETUP UTILITY
Main Advanced PCIPnP Boot Security Chipset Power Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Load Optimal Defaults?
[Ok] [Cancel]
Load Optimal Default values for all the setup questions.
F9 key can be used for this operation.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.58 (C)Copyright 1985-2004, American Megatrends, Inc.

4.2 Jumper Setting

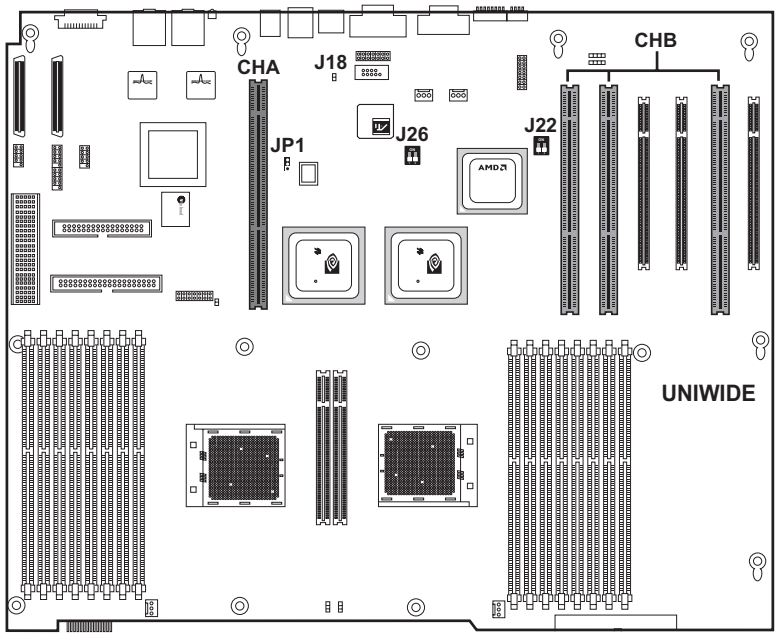
This section covers the jumper setting. Refer to the following illustration for the location of the jumpers.



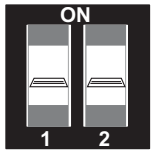
① PCI-X Speed CHB(J22)
② PCI-X Speed CHA(J26)
③ VGA Enable / Disable(J18)
④ Clear CMOS(JP1)

4.2.1 PCI-X Speed Setting(J22, J26)

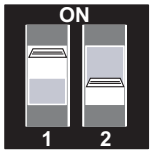
PCI-X speed can be seleted by the switch. Please follow the below instruction.



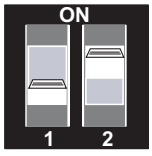
	133	100	66
1	OFF	ON	OFF
2	OFF	OFF	ON



1 Off: 2 Off - 133MHz



1 On: 2 Off - 100MHz



1 Off: 2 On - 66MHz

4.2.2 VGA Enable / Disable(J18)

This header lets you set your VGA port function. You can choose enable or disable this function. Onboard VGA can be disabled by setting this jumper on.

On	Off
Disable	Enable(default)

4.2.3 Clear CMOS Header

The onboard button cell battery powers the CMOS RAM. It contains all the BIOS setup information. Normally, it is necessary to keep the jumper connected to pin2 and pin3 (Default) to retain the RTC data as shown below.

1-2	2-3
Clear CMOS	Normal (default)

Follow these instructions to clear the CMOS RTC data:

① AC off.

② Short pin2 and pin3 with a jumper for a few seconds.

③ Replace the jumper on pin1 and pin2.

④ Turn on your computer by pressing the power-on button.

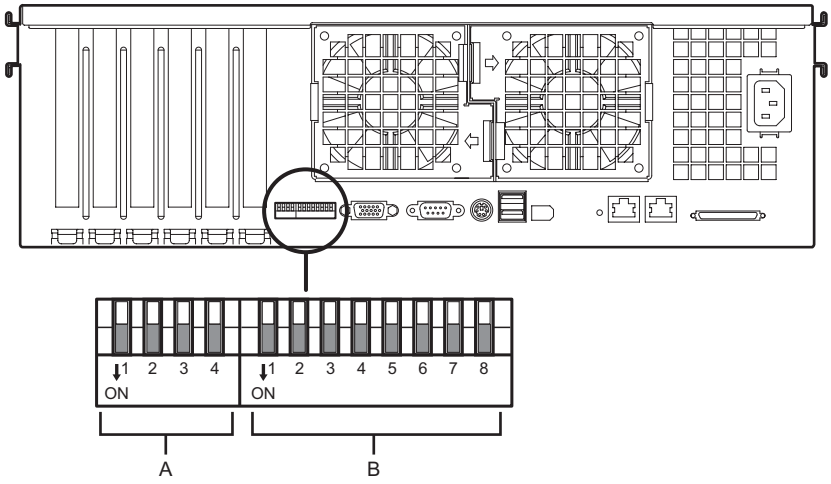
⑤ Hold down <Delete> during boot and select either the <Load Optimal Defaults> or <Load Failsafe Defaults> option in the selection "Exit". Then re-enter BIOS setup to re-enter user preferences. .

4.2.4 Geographical ID Setting

ID switch is used to decide identification, CPU number and type of server.
ServerDome is monitoring on the basis of identification, CPU number and type of server.

CAUTION

You have to install the ID switch before BMC F/W update.



ID Assignment

This sets up identification information of server.

ID	Binary	Switches(B)							
		1	2	3	4	5	6	7	8
0	00000000	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
10	00001010	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
124	01111100	OFF	OFF	ON	ON	ON	ON	ON	OFF

CPU Assignment

This sets up CPU number of server.

CPU Number	Description	Binary	Switches(A)	
			1	2
1	1-way	00	OFF	OFF
2	2-way	01	ON	OFF
3	3-way	10	OFF	ON
4	4-way	11	ON	ON

Server Type Assignment

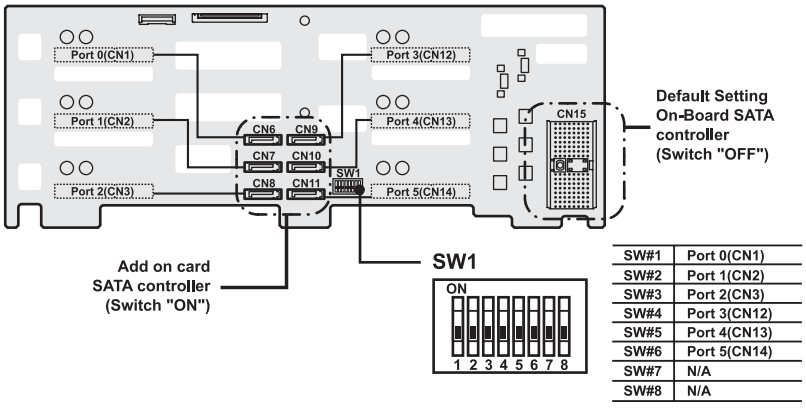
This sets up server type.

Type	Description	Binary	Switches(A)	
			3	4
1U	2way Passive	00	OFF	OFF
3U	2way Active/4way	01	ON	OFF
3U	Only 2way Passive	10	OFF	ON

4.2.6 DIP SW1 Setting on the SATA BP

DIP SW1 is used to decide which controller we will use in system.

Default setting is all OFF for on-board SATA controller. If you want to use add-on SATA controller, you have to set the switch to "ON" like below picture.



5. Software & Utilities

5.1 NVRAID

5.1.1 Basic Configuration Instruction

The following are the basic steps for configuring NVRAID

5.1.1.1 Non-Bootable RAID Array

① Choose the hard disks that are to be RAID enabled in the system BIOS.

② Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.

③ Install the operating system on one hard disk, then reboot the system.

④ Run the Windows nForce Setup application and install the RAID driver.

⑤ Initialize the NVRAID Array.

5.1.1.2 Bootable RAID Array

① Choose the hard disks that are to be RAID enabled in the system BIOS.

② Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), or Spanning (JBOD) and create the desired RAID array.

③ Boot from the Windows CD, then press F6 when the Windows Setup appears.

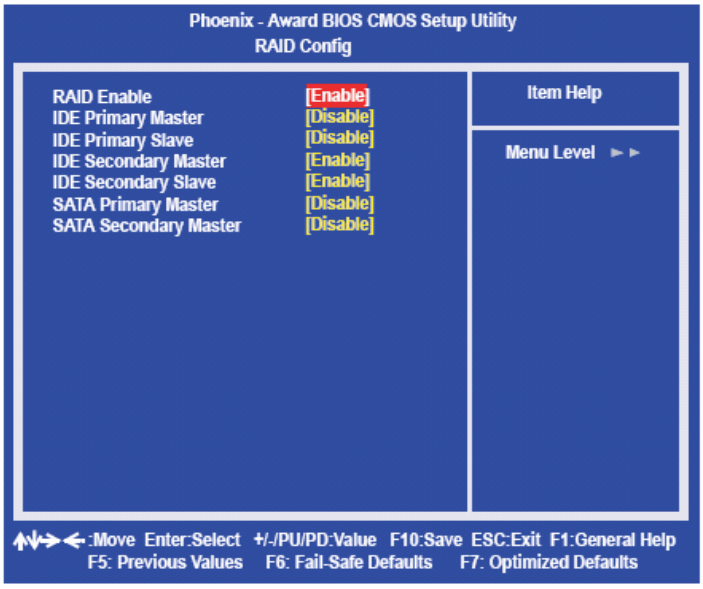
④ Insert the RAID driver floppy to install the nForce RAID diver.

⑤ Initialize the NVRAID Array.

5.1.2 Setting up the BIOS

① Start your computer, then press Delete to enter the BIOS setup.
Use the arrow keys to select Integrated Peripherals, then press Enter.

② Use the arrow keys to select the RAID Config (see the picture), then press Enter.


Phoenix - Award BIOS CMOS Setup Utility
RAID Config
RAID Enable [Enable]
IDE Primary Master [Disable]
IDE Primary Slave [Disable]
IDE Secondary Master [Enable]
IDE Secondary Slave [Enable]
SATA Primary Master [Disable]
SATA Secondary Master [Disable]
Item Help
Menu Level ►►
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F6: Fail-Safe Defaults F7: Optimized Defaults

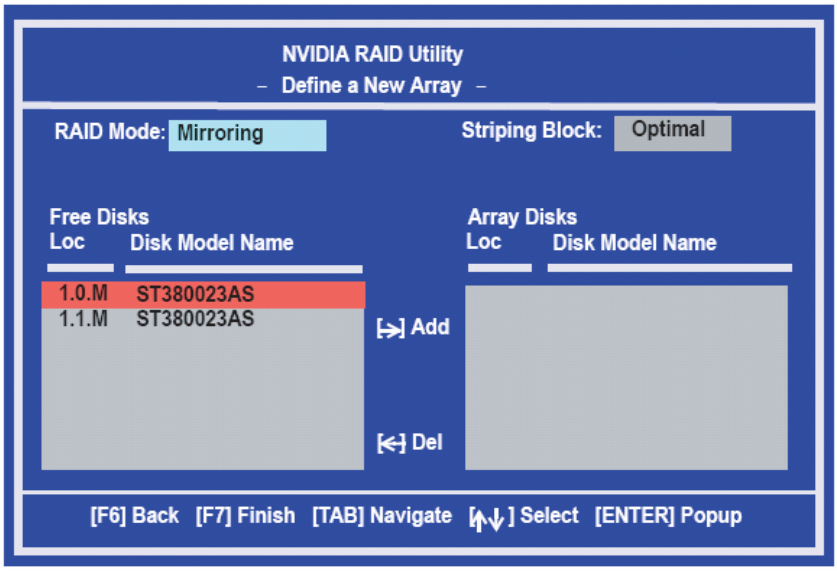
③ From the RAID Config window, "enable" the RAID Enable, the other items would be light, then you can enable the disk that you want to use as RAID disks.

④ Press F10 to save the configuration and exit.

5.1.3 Entering the RAID BIOS Setup Basic Configuration Instruction

① After rebooting your system, wait until you see the RAID software prompting you to press F10. The RAID prompt appears as part of the system POST and boot process prior to loading the OS.

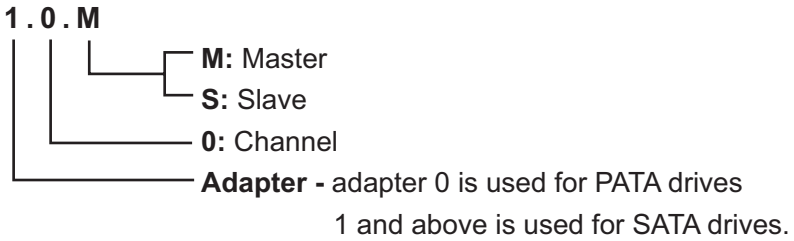
② Press <N>, and the NVIDIA RAID Utility-Define a New Array window will appears(See the picture). The default RAID Mode is set to Mirroring and Striping Block is set to Optimal.



5.1.3.1 Understanding the Define a New Array Window

Use the Define a New Array window to

- Select the RAID Mode
- Set up the Striping Block
- Specify which disks to use for the RAID Array
  Depending on the platform used, the system can have one or more channels.
  In a typical system there is usually one controller and multiple channels, and each channel has a slave and a master.
  The channel/controller/master/slave status of each hard disk is given in the Loc(location) columns of the Free Disks and Array Disks lists.



In upper picture 1.0.M means the hard drive is attached to Adapter 1, Channel 0, and the drive is set to Master. The following is a list of all possible combinations:

Serial ATA	1.0.M	Adapter 1, Channel 0, Master
	1.1.M	Adapter 1, Channel 1, Master
	1.2.M	Adapter 1, Channel 2, Master
	1.3.M	Adapter 1, Channel 3, Master
	2.1.M	Adapter 2, Channel 1, Master
	2.2.M	Adapter 2, Channel 2, Master

NOTICE

There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the controller.

5.1.3.2 Using the Define a New Array Window

If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

Selecting the RAID Mode

By default, this is set to Mirroring. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box-either Mirroring, Striping, Spanning, or Stripe Mirroring.

Selecting the Striping Block Size

Striping block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default Optimal, which is 32KB, but the values can be between 4 KB and 128 KB.

Assigning the Disks

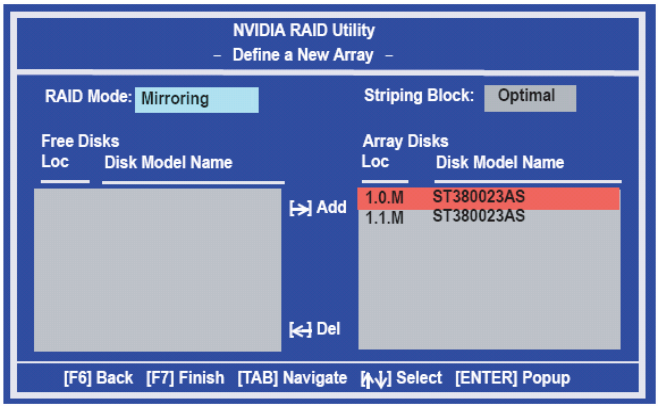
The disks that you enabled from the RAID Config BIOS setup page appear in the Free Disks block. These are the drives that are available for use as RAID array disks. To designate a free disk to be used as a RAID array disk,

① Tab to the Free Disks section. The first disk in the list is selected

② Move it from the Free Disks block to the Array Disks block by pressing the right arrow key(→). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.

③ Continue pressing the right-arrow key (→) until all the disks that you want to use as RAID array disks appear in the Array Disks block.

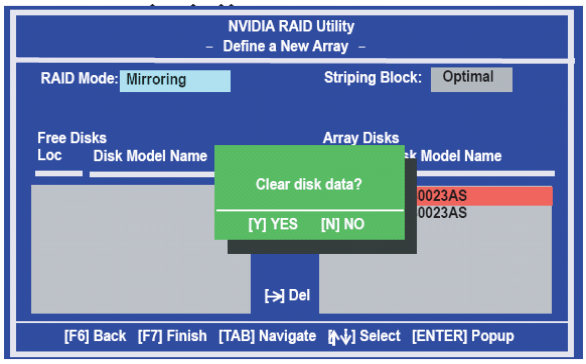
the below picture illustrates the Define a New Array window after two disks have been assigned as RAID1 array disks.



5.1.3.3 Completing the RAID BIOS Setup

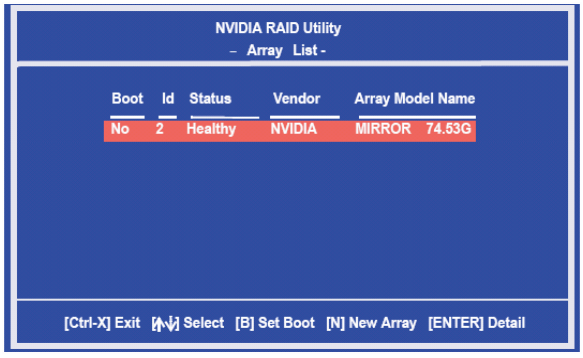
① After assigning your RAID array disks, press F7.

The Clear disk data prompt appears.



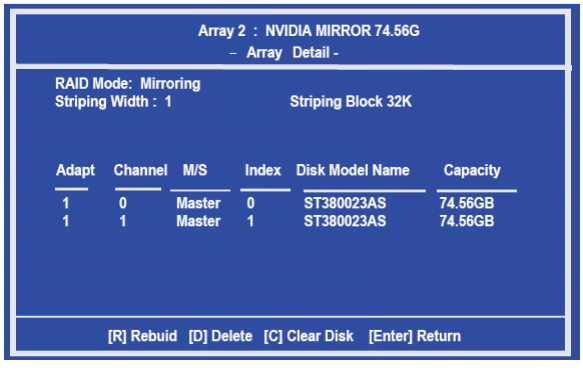
② Press Y to clear all drive data.

The Array List screen appears, where you can review the RAID arrays that you have set up.


NVIDIA RAID Utility
– Array List -
Boot Id Status Vendor Array Model Name
No 2 Healthy NVIDIA MIRROR 74.53G
[Ctrl-X] Exit [↑↓] Select [B] Set Boot [N] New Array [ENTER] Detail

③ Use the arrow keys to select the array that you want to set up, and then press Enter.

The Array Detail screen appears.


Array 2 : NVIDIA MIRROR 74.56G
– Array Detail -
RAID Mode: Mirroring
Striping Width : 1
Striping Block 32K
Adapt Channel M/S Index Disk Model Name Capacity
1 0 Master 0 ST380023AS 74.56GB
1 1 Master 1 ST380023AS 74.56GB
[R] Rebuid [D] Delete [C] Clear Disk [Enter] Return

The Array Detail screen shows information about the array that you selected, such as Striping Block used, RAID Mode, Striping Width, Disk Model Name, and disk capacity.

④ If you want to mark this disk as empty and wipe out all its contents then press C.

⑤ At the prompt, press Y to wipe out all the data, otherwise press N.

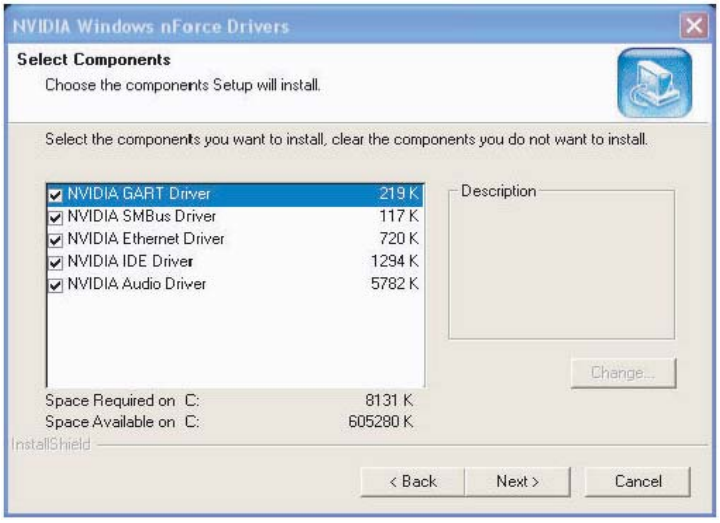
⑥ Press Enter again to go back to the previous window and then press F10 to exit the RAID setup.

5.1.4 NVIDIA RAID Utility installation

5.1.4.1 Installing the NVIDIA RAID Software Under Windows (For Non-bootable RAID Array)

This section describes how to setup the application and install the RAID software which will upgrade the Windows IDE driver and install the RAID driver.

① Start the nForce Setup program to open the NVIDIA Windows nForce Drivers page.


NVIDIA Windows nForce Drivers
Select Components
Choose the components Setup will install.
Select the components you want to install, clear the components you do not want to install.
NVIDIA GART Driver 219 K
NVIDIA SMBus Driver 117 K
NVIDIA Ethernet Driver 720 K
NVIDIA IDE Driver 1294 K
NVIDIA Audio Driver 5782 K
Description
Change...
Space Required on C: 8131 K
Space Available on C: 605280 K
InstallShield
< Back
Next >
Cancel

② Select the modules that you want to install. Select the relative options that you have configured.

③ Click Next and then follow the instructions.

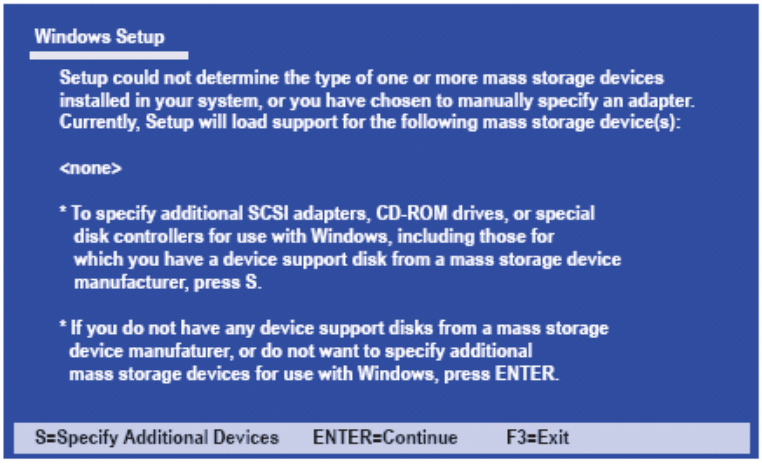
④ After the installation is completed, be sure to reboot the system.

⑤ After the reboot. Initialize the newly created array.

5.1.4.2 Installing the RAID Driver (For bootable RAID Array)

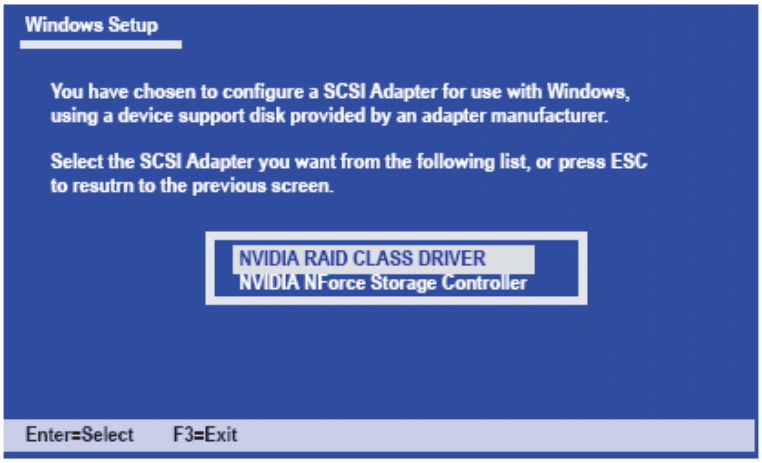
① After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows Setup program starts.

② Press F6 and wait for the Windows Setup screen to appear.


Windows Setup
Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage device(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufaturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Devices
ENTER=Continue
F3=Exit

③ Specify the NVIDIA drivers:

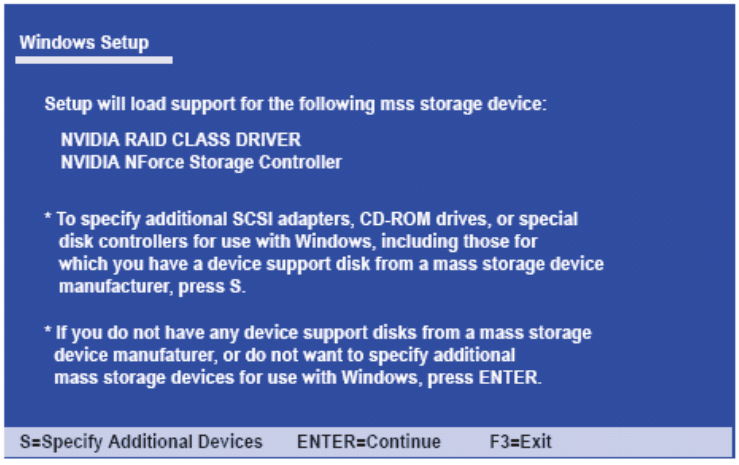
ⓐ Insert the floppy that has the RAID dirver, press S, then press Enter. The Windows Setup screen appears as below:


Windows Setup
You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to resutrn to the previous screen.
NVIDIA RAID CLASS DRIVER
NVIDIA NForce Storage Controller
Enter=Select
F3=Exit

ⓑ Select "NVIDIA RAID CLASS DIRVER" and then press Enter

ⓒ Press S again at the Specify Devices screen, then press Enter.

ⓓ Select " NVIDIA nForce Storage Controller" and then press Enter.
The following Windows Setup screen appears listing both drivers:


Windows Setup
Setup will load support for the following mss storage device:
NVIDIA RAID CLASS DRIVER
NVIDIA NForce Storage Controller
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufaturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Devices
ENTER=Continue
F3=Exit

④ Press Enter to continue with operating system Installation, Be sure to copy the files from the floppy is complete, then take out the floppy.

⑤ Following the instructions on how to install operating system, During the GUI portion of the installation you might be prompted to click Yes to install the RAID driver.
Click Yes as many times as needed in order to finish the installation.
This will not be an issue with a signed dirver.

NOTICE

Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

5.2 Adaptec SCSI with HostRAID(Optional)

This chapter provides information on the Small Computer System Interface (SCSI) BIOS setup utility and allows you to configure the SCSI subsystem for optimum use.

You may need to run the SCSI BIOS setup utility when:

- You want to change the default SCSI controller settings for customized features.
- You intend to manage any of the attached SCSI devices.

5.2.1 Entering SCSI BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Ctrl> + <A> keys simultaneously to enter SCSI BIOS utility.

<<< Press <Ctrl><A> for SCSI Select(TM) Utility >>>

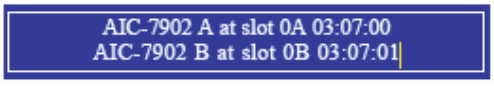
Control Keys

Use the following keys to navigate the SCSI BIOS menu items.

<↑> <↓> <←> <→>	Move between different items
<Enter>	Select the item or show the options of the selected item
<Esc>	Exit the menu or return to the main menu from a submenu
<F6>	Restore the default SCSI values

Selecting the SCSI Channel

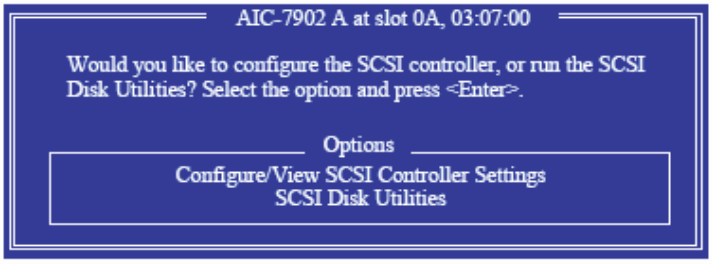
After entering the SCSI BIOS by pressing the <Ctrl> + <A> key combination, you will see the following menu appear on the screen.



Each item represents one SCSI channel (connector). The mainboard offers dual onboard SCSI channels: channel A & channel B. Move the cursor to the desired channel and then press <Enter>.

Selecting the Management Type

The following screen will appear after you select the SCSI channel you intend to manage. The menu will list two categories for you to choose what to do with the SCSI channel. Move the cursor to the desired function and press <Enter>.


AIC-7902 A at slot 0A, 03:07:00
Would you like to configure the SCSI controller, or run the SCSI Disk Utilities? Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
SCSI Disk Utilities

Configure/View SCSI Controller Settings

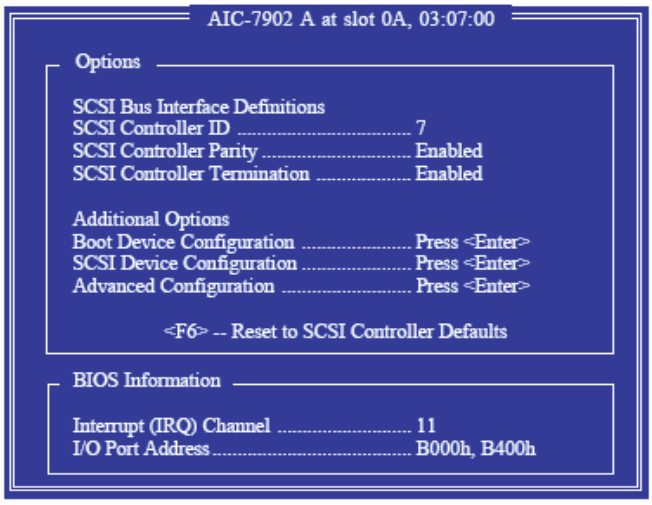
Use this option for SCSI controller configurations.

SCSI Disk Utilities

Use this option to manage the attached SCSI device.

5.2.2 Configure/View SCSI Controller Settings

There are 8 items in the "Configure/View SCSI Controller Settings" screen. These items display or allow you to change the SCSI controller's settings. Use the arrow keys to highlight the item and then press <Enter> to select the value you want in each item or enter each item's sub-menu screen.


AIC-7902 A at slot 0A, 03:07:00
Options
SCSI Bus Interface Definitions
SCSI Controller ID 7
SCSI Controller Parity ..... Enabled
SCSI Controller Termination ..... Enabled
Additional Options
Boot Device Configuration ..... Press <Enter>
SCSI Device Configuration ..... Press <Enter>
Advanced Configuration ..... Press <Enter>
<F6> -- Reset to SCSI Controller Defaults
BIOS Information
Interrupt (IRQ) Channel 11
I/O Port Address B000h, B400h

5.2.2.1 SCSI Bus Interface Definitions

SCSI Controller ID

The item is used to assign a SCSI ID to the SCSI controller. It is recommended that you should leave the default setting unchanged.

Settings: [0]~[15].

SCSI Controller Parity

Use the field to enable or disable SCSI parity error checking function. If any of your SCSI devices does not support parity checking, disable this function. While disabling the function, you should disable disconnections for all devices, as parity checking for the reselection phase is NOT disabled. A non-parity device's I/O operation will never complete if the reselection fails due to a parity error.

SCSI Controller Termination

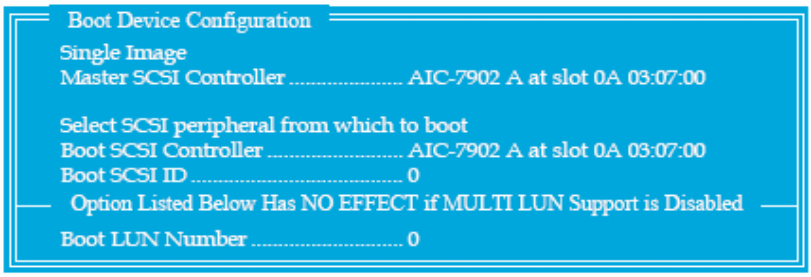
In order to have the SCSI bus function properly and reliably, termination at the ends of the SCSI bus is necessary. Proper termination can ensure signal on the SCSI bus will not reflect and cause data loss or errors.

Settings options: [Enabled], [Disabled].

5.2.2.2 Additional Options

Boot Device Configuration

Press <Enter> to enter the sub-menu screen.


Boot Device Configuration
Single Image
Master SCSI Controller ..... AIC-7902 A at slot 0A 03:07:00
Select SCSI peripheral from which to boot
Boot SCSI Controller ..... AIC-7902 A at slot 0A 03:07:00
Boot SCSI ID 0
Option Listed Below Has NO EFFECT if MULTI LUN Support is Disabled
Boot LUN Number 0

- Boot SCSI Controllers

  Select either SCSI channel A (AIC-7902 A) or channel B (AIC-7902 B) to boot up the SCSI subsystem.

- Boot SCSI ID

  Specify a SCSI device to become the boot device by selecting its SCSI ID.
  Setting options: [0]~[15].

- Boot LUN Number

  If a boot device has multiple logical units, you must specify the boot logical unit number (LUN). If multiple LUN support is disabled, specifying a number here is useless.
  Setting options: [0]~[7].

SCSI Device Configuration

Press <Enter> and the following sub-menu screen appear. The sub-menu screen allows you to specify the configuration for each device on the SCSI bus.

SCSI Device Configuration

SCSI Device ID	#0	#1	#2	#3	#4	#5	#6	#7
Sync Transfer Rate (MB/Sec)	320	320	320	320	320	320	320	320
Packetized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
QAS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initiate Wide Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enable Disconnection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Send Start Unit Command	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

SCSI Device ID	#8	#9	#10	#11	#12	#13	#14	#15
Sync Transfer Rate (MB/Sec)	320	320	320	320	320	320	320	320
Packetized	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
QAS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initiate Wide Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enable Disconnection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Send Start Unit Command	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

- Sync Transfer Rate (MB/Sec)

  The field allows you to specify the maximum synchronous data transfer rate depending on the type of each SCSI device. Select [ASYN] to enable asynchronous negotiation for some older SCSI devices.

- Packetized

  When enabled, the device drivers support this option.
  However, this option is not supported by the BIOS.

- QAS

  When enabled, the device drivers support this option.
  However, this option is not supported by the BIOS.

- Initiate Wide Negotiation

  When set to [Yes], the field allows wide SCSI hard drives to use 16-bit (2 bytes) transfers.

- Enable Disconnection

  This field tells the SCSI controller whether or not to allow the specified SCSI device to disconnect during an I/O transfer operation. The disconnection ability frees the SCSI bus to allow other I/O processes and thus optimizes the SCSI bus performance.
  Setting options: [Yes], [No].

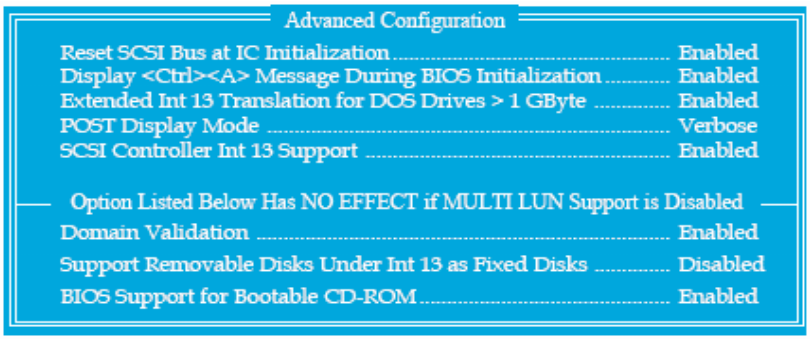
- Send Start Unit Command
  When set to Yes, the SCSI controller sends the Start Unit command to the specified SCSI device during bootup. The interface powers up the SCSI device on-at-a-time during bootup, reducing the load on the computer's power supply.
  Setting options: [Yes], [No].

- BIOS Multiple LUN Support
  Select [Yes] when any SCSI device has multiple logical units.
  Setting options: [Yes], [No].

- Include in BIOS Scan
  Selecting [Yes] allows the SCSI controller to control the SCSI device with its SCSI ID. When set to [No], the SCSI controller does not control the specified SCSI device by not scanning for the SCSI ID during bootup, but the boot time will be decreased.
  Setting options: [Yes], [No].

Advanced Configuration

Press <Enter> to enter the sub-menu screen for advanced configuration.


Advanced Configuration
Reset SCSI Bus at IC Initialization ..... Enabled
Display <Ctrl><A> Message During BIOS Initialization ..... Enabled
Extended Int 13 Translation for DOS Drives > 1 GByte ..... Enabled
POST Display Mode ..... Verbose
SCSI Controller Int 13 Support ..... Enabled
Option Listed Below Has NO EFFECT if MULTI LUN Support is Disabled
Domain Validation ..... Enabled
Support Removable Disks Under Int 13 as Fixed Disks ..... Disabled
BIOS Support for Bootable CD-ROM ..... Enabled

- Reset SCSI Bus at IC Initialization

  Selecting [Enabled] will reset the SCSI bus the first time the SCSI controller is initialized.

  Setting options: [Enabled], [Disabled].

- Display <Ctrl><A> Message During BIOS Initialization

  When enabled, the message "Press <Ctrl><A> for SCSISelect(TM) Utility" appears on the screen during bootup. If disabled, the message does not show up, but you can still press <Ctrl> + <A> key combination to enter the SCSI BIOS utility.

  Setting options: [Enabled], [Disabled].

- Extended Int 13 Translation for DOS Drives > 1 Gbyte

  The field allows SCSI hard disk drives greater than 1 GB to use a translation scheme of 255 heads, 63 sectors per track.

  Setting options: [Enabled], [Disabled].

- POST Display Mode

  The field determines how much information about your SCSI controller and devices appear on the screen during bootup. For the most complete information, choose [Diagnostic]. For a faster boot, select [Silent].

  Setting options: [Verbose], [Silent], [Diagnostic].

- SCSI Controller Int 13 Support

  The field allows you to enable or disable the support for Int 13h. The software interrupt "Int 13h" is the interface through which the operating system or application is able to pass commands to hard disk drives, such as reading, writing and formatting.

  Setting options: [Enabled], [Disabled: NOT scan], [Disabled: scan bus].

- Domain Validation

  When enabled, these options are available if they are implemented in the device drivers. However, this option is not supported by the BIOS.

- Support Removable Disks Under Int13 as Fixed Disks

  When [Boot Only] is selected, only the removable media drive designated as the boot device will be treated as a hard disk drive. When [All Disks] is selected, all removable media drives supported by the BIOS are treated as hard disk drives.
  If selecting [Disabled], no removable media drive is treated as a hard disk drive and the removable media drives must be controlled by the OS drivers.

- BIOS Support for Bootable CD-ROM

  When enabled, the SCSI controller BIOS supports bootable CD-ROM under the El Torito specification. If booting from a hard disk or other device, make sure no bootable CD-ROM is inserted or disable this option.

5.2.2.3 BIOS Information

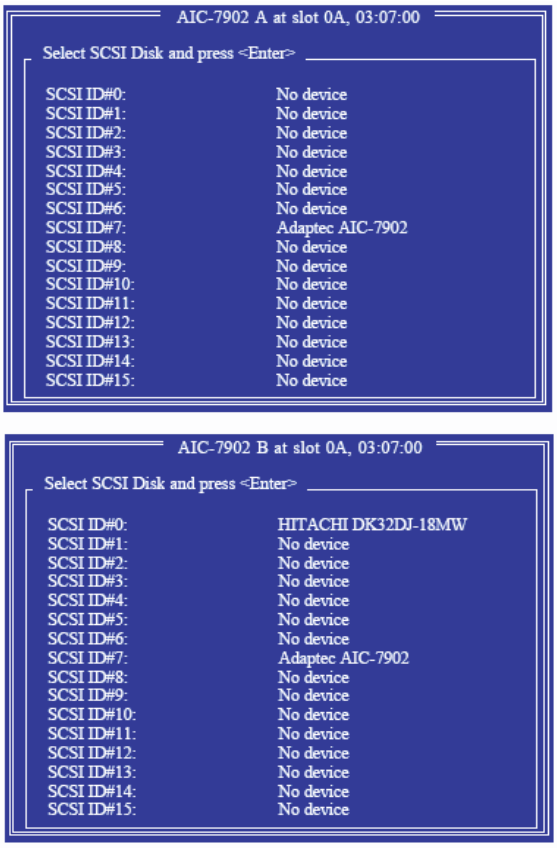
Interrupt (IRQ) Channel

Displays the IRQ line assigned to the SCSI channel.

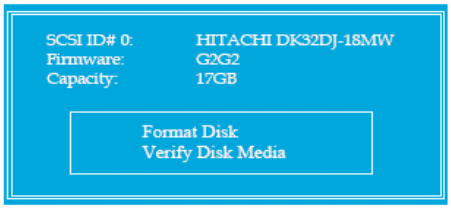
I/O Port Address

Displays the I/O port address assigned to the SCSI channel.

5.2.3 Disk Utilities


AIC-7902 A at slot 0A, 03:07:00
Select SCSI Disk and press <Enter>
SCSI ID#0: No device
SCSI ID#1: No device
SCSI ID#2: No device
SCSI ID#3: No device
SCSI ID#4: No device
SCSI ID#5: No device
SCSI ID#6: No device
SCSI ID#7: Adaptec AIC-7902
SCSI ID#8: No device
SCSI ID#9: No device
SCSI ID#10: No device
SCSI ID#11: No device
SCSI ID#12: No device
SCSI ID#13: No device
SCSI ID#14: No device
SCSI ID#15: No device
AIC-7902 B at slot 0A, 03:07:00
Select SCSI Disk and press <Enter>
SCSI ID#0: HITACHI DK32DJ-18MW
SCSI ID#1: No device
SCSI ID#2: No device
SCSI ID#3: No device
SCSI ID#4: No device
SCSI ID#5: No device
SCSI ID#6: No device
SCSI ID#7: Adaptec AIC-7902
SCSI ID#8: No device
SCSI ID#9: No device
SCSI ID#10: No device
SCSI ID#11: No device
SCSI ID#12: No device
SCSI ID#13: No device
SCSI ID#14: No device
SCSI ID#15: No device

Select the SCSI device, which you want to manage by highlighting the item and press <Enter>. The following dialog box appears. Select the function you want to perform.



Format Disk

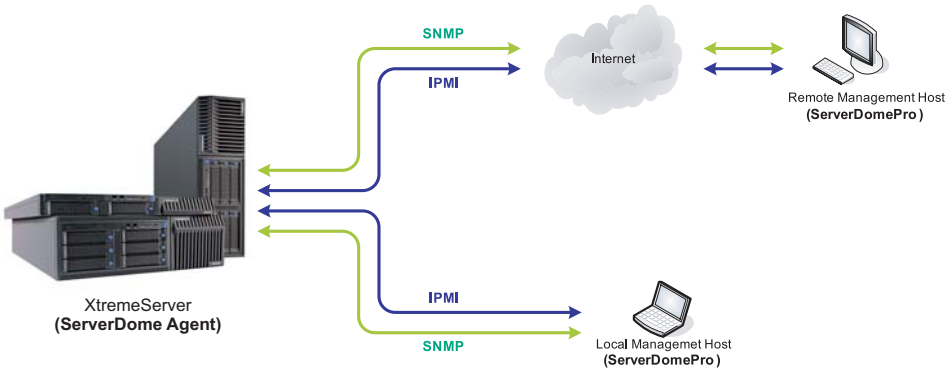
The utility performs low-level formatting of a hard disk drive. The function might take several hours to complete.

Verify Disk Media

This utility verifies that the drive is functioning properly. Verifying function will scan for media defects on the disk.

5.3 ServerDome

The ServerDome provides remote server management for the XtremeServer 1U and 3U. With comprehensive management capabilities from a single graphical console, ServerDome remote management software automates and simplifies IT and networking tasks, letting the system administrator deploy, configure, manage and maintain X number of servers.
The ServerDome remote management capabilities are IPMI 2.0 compliant and work with either Windows or Linux.



Key Features

- Easy to set up and manage
- Provides graphic user interface
- Failure notifications with customized e-mail and popup message.
- Provides remote management capabilities through SNMP and IPMI.
- System HW resource real-time monitoring
- System OS resource real-time monitoring

NOTICE

For details, please refer to the ServerDome manual which included ServerDome CD.

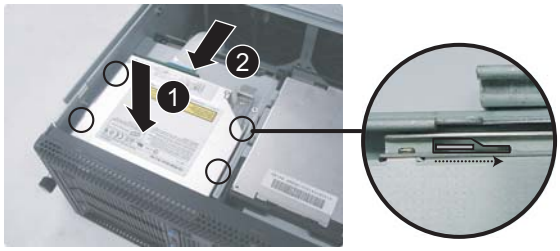
Part II. Technical Guide

1. Removing & Installing System Components

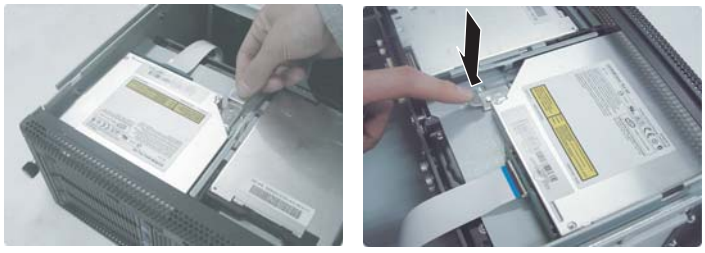
1.1 Installing the CD-ROM Drive

① Screw two brackets and the interface board to the CD-ROM.

② Locate the CD-ROM kit right into the place on the chassis and then slide it forward.



③ Push the lock tension down to secure the CD-ROM kit.



④ Install the FFC(Flexible Flat Cable) of CD-ROM drive.

CAUTION

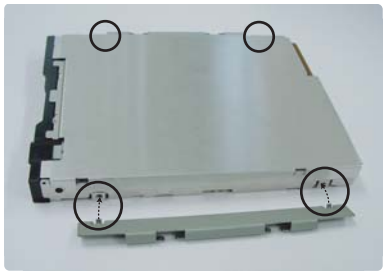
Face the conduct side down and lock the connector to secure the cable.
Do not treat the connector by force.

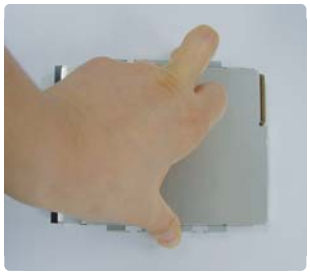
1.2 Installing the Floppy Disk Drive

CAUTION

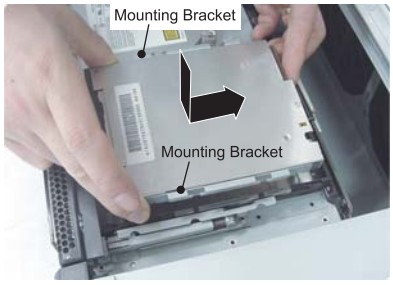
In installing the FDD, take the locking pin away from the FDD housing beforehand.

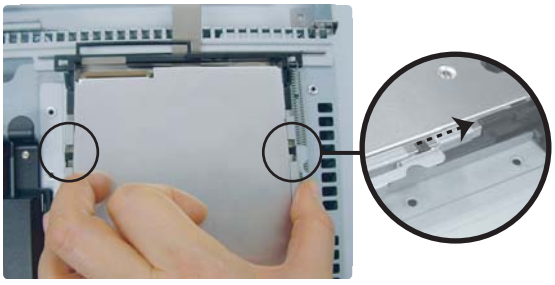
① Install the FDD with two mounting bracket.



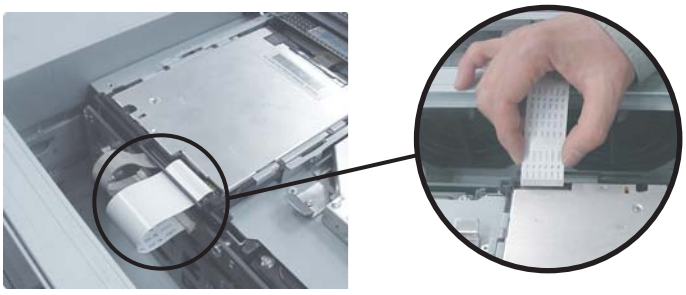


② Install the FDD with two mounting brackets in the plastic housing as shown below.





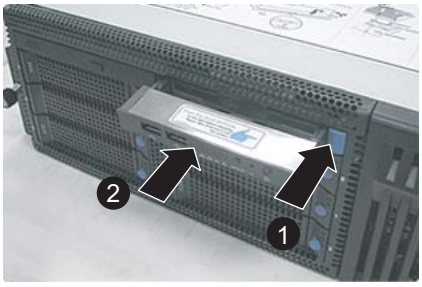
③ Install the FDD cable to backplane.



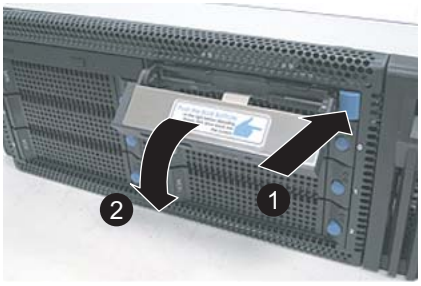
CAUTION

Face the conduct side up and lock the connector to secure the cable.
Do not treat the connector by force.

④ Push the button and slide the front LED panel back into the system.
To use the FDD, push the blue button and it will come up to the front.



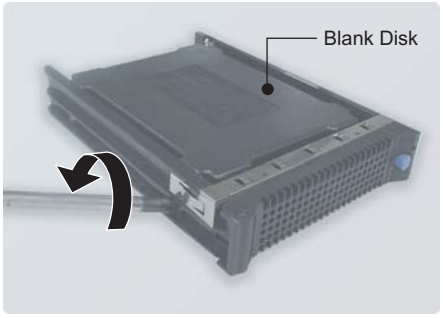
Close the FDD



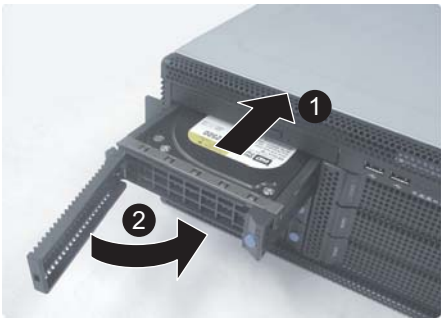
Use the FDD

1.3 Installing the Hard Disk Drive

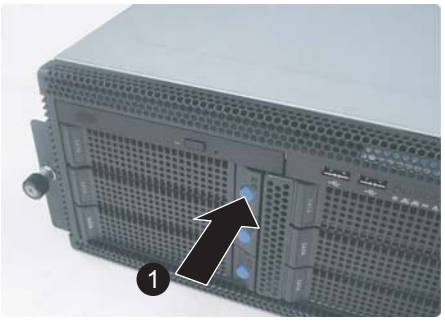
① Remove the blank disk from the disk carrier and secure HDD to the carrier with four screws. Keep the blank disk for the future use.

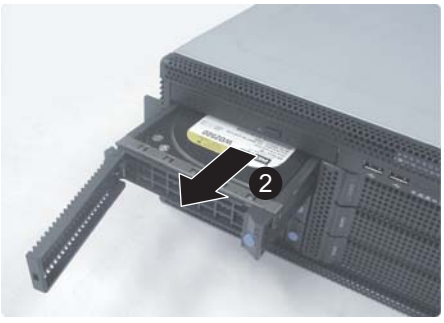


② Insert the disk carrier into the bay and then close the handle to lock.



③ Removing the HDD carrier: push the release button of the carrier and gently pull the drive carrier outward.



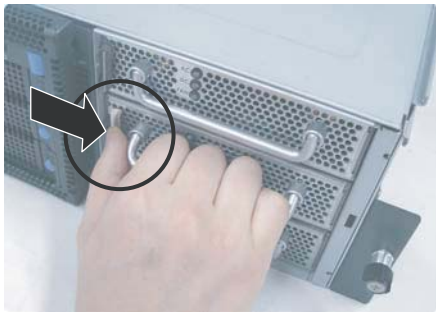


1.4 Removing the Power Supply Unit

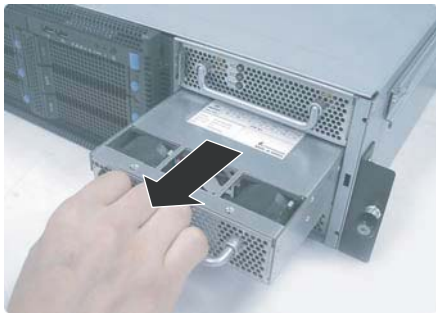
CAUTION
In replacing the power supply, handle the unit with care because it is heavy.

Push the release button on the right side of the front bezel and remove it.

With the handle held, release the locking latch.



Pull out the power supply.



1.5 Replacing the Cooling Fan Unit

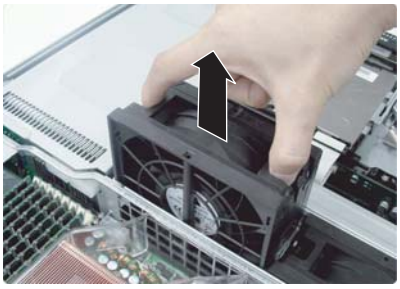
WARNING

Do not remove the fan module while operating the system.
In installing the fan module, carefully set the unit on the fan connector.

1.5.1 Center Fan Unit

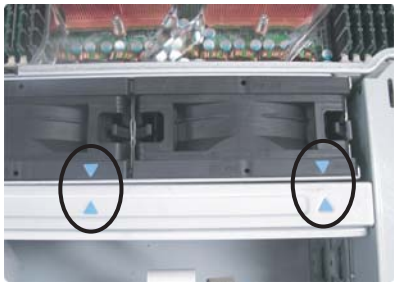
① Push both latches of the fan module.

② Lift the fan module upward and set it away from the system.



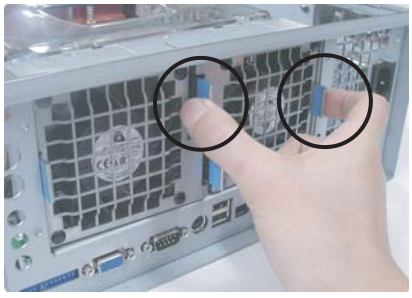
③ Locate the fan module on the chassis and align arrow mark with that on chassis.

④ Push the fan module carefully down.



1.5.2 Rear Fan Unit

① Push both latches of the fan module.



② Pull the fan module out and set it away from the system.

③ Locate the fan module on the locking guide of the chassis.

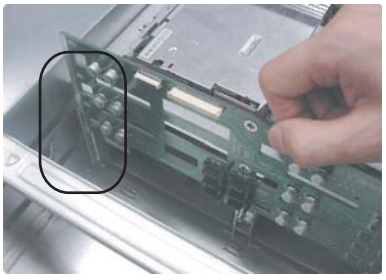
④ Push the fan module in carefully.

1.6 Replacing the Interface Unit

1.6.1 Backplane Unit

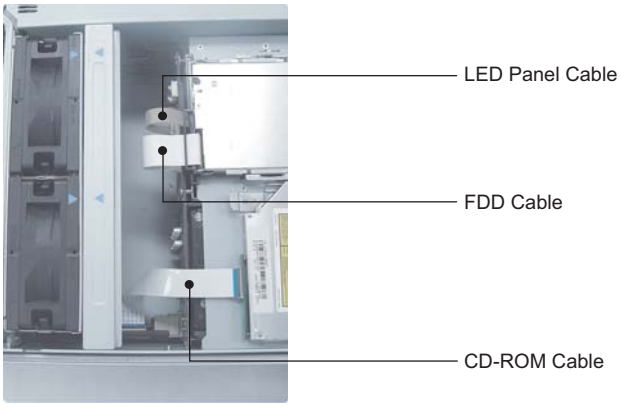
CAUTION
Before installing IFB, remove HDD carrier and locate FDD forward.

① Slide down the backplane board along the holding guide.



② Secure backplane board with two screws.

③ Install the FDD and Front LED cables to the backplane.



1.6.2 Interface Board(IFB) Unit

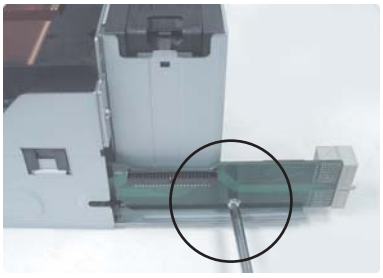
① Secure the interface board with bracket.

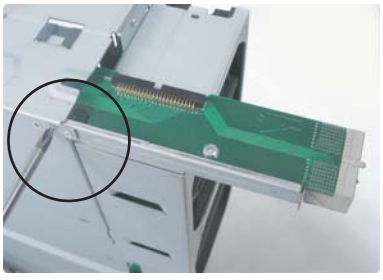
② Install Z-PACK connector into a connector of the motherboard.

WARNING

Be carefully as inserting Z-PACK connector into a connector.

③ Install the interface unit into the chasiss and secure it with three screws.





1.6.3 Center FAN Cage Unit

① Secure the center fan cage to cage rear with the two screws after aligning fan connector of fan board with header of motherboard.

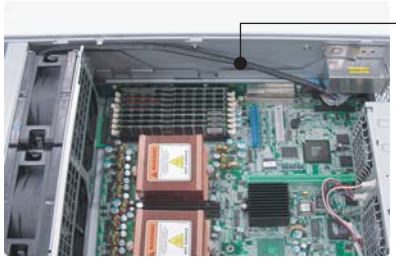
1.6.4 SCSI Cable

WARNING

Routing SCSI cable should be prior to installing Interface unit.

1.6.4.1 Using Onboard SCSI Controller

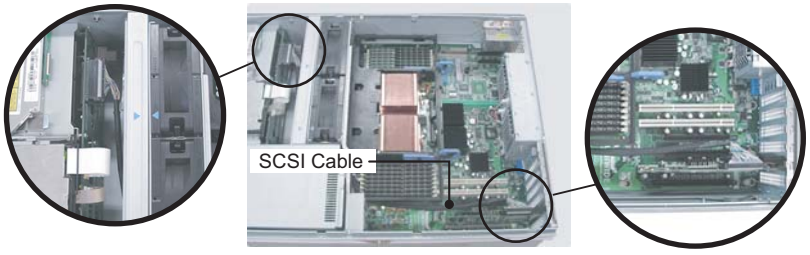
① SCSI cable way



② Connect the SCSI cable to the backplane.

1.6.4.2 Using RAID Card

① SCSI cable way



② Connect the SCSI cable to the backplane.

NOTICE

The SATA Cable way is
the same as the SATA RAID Card.

1.7 Installing the Motherboard

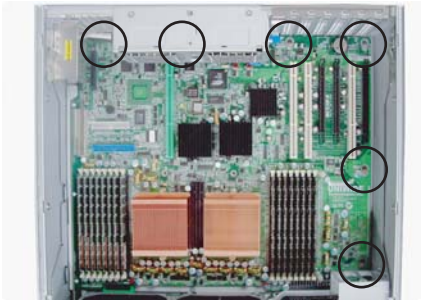
CAUTION
In order to remove or install the motherboard, disassemble the rear cage unit from the system beforehand.

① Attach two heatsink back plates on the bottom side of motherboard.

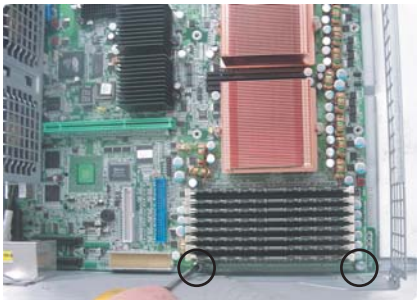
CAUTION
Remove the paper cover of the heatsink back plate before use.

② Place the motherboard on the key hole standoffs of the chassis so that each of the six mounting holes fit into the key hole standoffs.

CAUTION
Insert the front side of motherboard into the chassis first. In placing the motherboard, check the ID LED's hole.

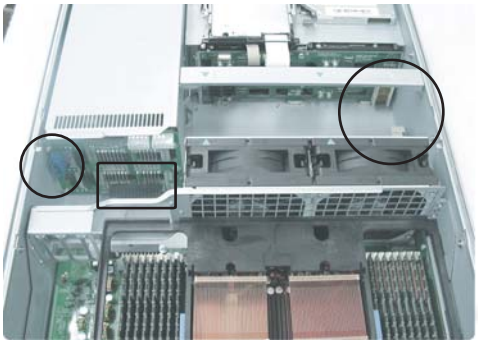


③ Secure the motherboard on the chassis with the screws.

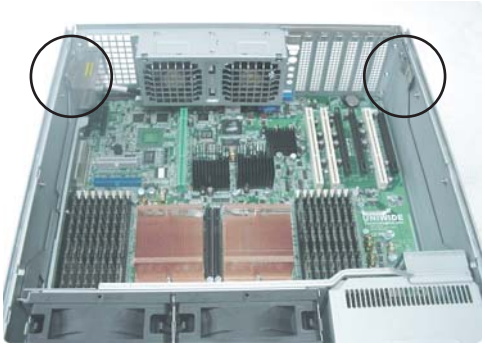


1.8 Installing the Rear Cage Unit

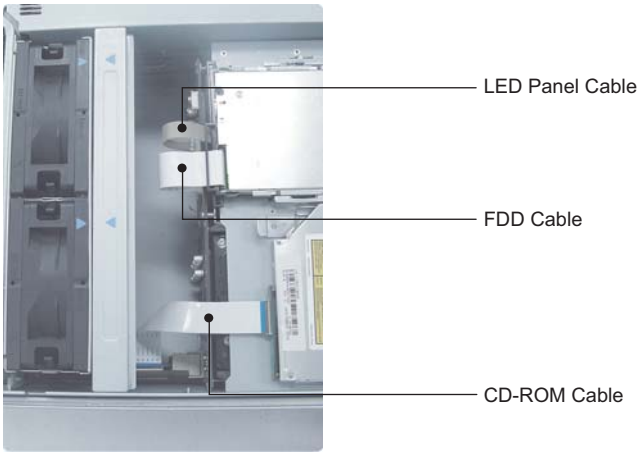
① Push slowly Cage Rear into a chassis until making a click sound.



② Check the Latch rear cage locking.



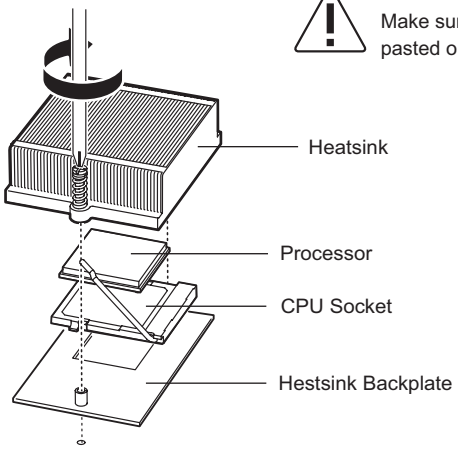
③ Install the cable for FDD, front LED panel and CD-ROM drive.



1.9 Installing the CPU Heatsink

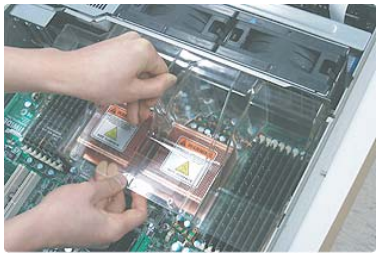
CAUTION

Make sure that thermal interface material should be pasted on the bottom side of the heatsink.

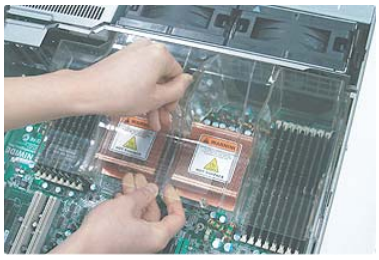


1.10 Installing the Air Duct

① Align the air duct with the guide of the chasiss and put it on top of the motherboard.



② Push it down and carefully check whether it is secured.



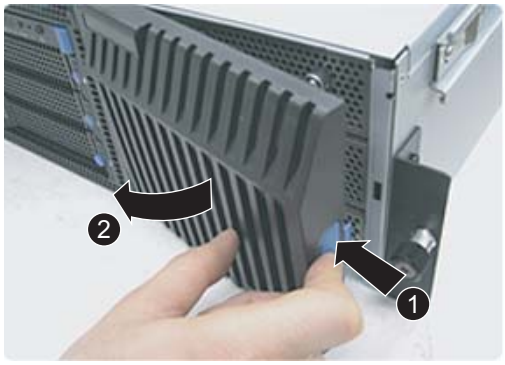
③ In order to remove the air duct, hold the hand guide of duct and remove it away from the system with care.

1.11 Installing the Front Bezel

① Locate the front bezel on the chassis as shown below.

② Align the bezel with guide hole of chassis and press right parts of bezel to secure it.

③ In order to remove the bezel, press Push button and Pull it out.



Appendix

A. BIOS Post Code

AMIBIOS8 Check Point and Beep Code List

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS.

Checkpoint	Description
Before D0	If boot block debugger is enabled, CPU cache-as-RAM functionality is enabled at this point. Stack will be enabled from this point.
D1	Early super I/O initialization is done including RTC and keyboard controller. Serial port is enabled at this point if needed for debugging. NMI is disabled. Perform keyboard controller BAT test. Save power-on CPUID value in scratch CMOS. Go to flat mode with 4GB limit and GA20 enabled.
D2	Verify the boot block checksum. System will hang here if checksum is bad.
D3	Disable CACHE before memory detection. Execute full memory sizing module. If memory sizing module not executed, start memory refresh and do memory sizing in Boot block code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM. Copies compressed boot block code to memory in right segments. Copies BIOS from ROM to RAM for faster access. Performs main BIOS checksum and updates recovery status accordingly.
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. If BIOS recovery is necessary, control flows to checkpoint E0. See Bootblock Recovery Code Checkpoints section of document for more information.
D7	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See POST Code Checkpoints section of document for more information.

Checkpoint	Description
DC	System is waking from ACPI S3 state
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system.
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
C0	Early CPU Init Start -- Disable Cache - Init Local APIC
C1	Set up boot strap processor Information
C2	Set up boot strap processor for POST
C5	Enumerate and set up application processors
C6	Re-enable cache for boot strap processor
C7	Early CPU Init Exit
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1.
	Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.

Checkpoint	Description
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See DIM Code Checkpoints section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ··· etc.) successfully installed in the system and update the BDA, EBDA ··· etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD type matic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8D	Build ACPI tables (if ACPI is supported)
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialize of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.

Checkpoint	Description
A9	Wait for user input at configuration display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. De-initializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).